

skin diver

the diver's bible

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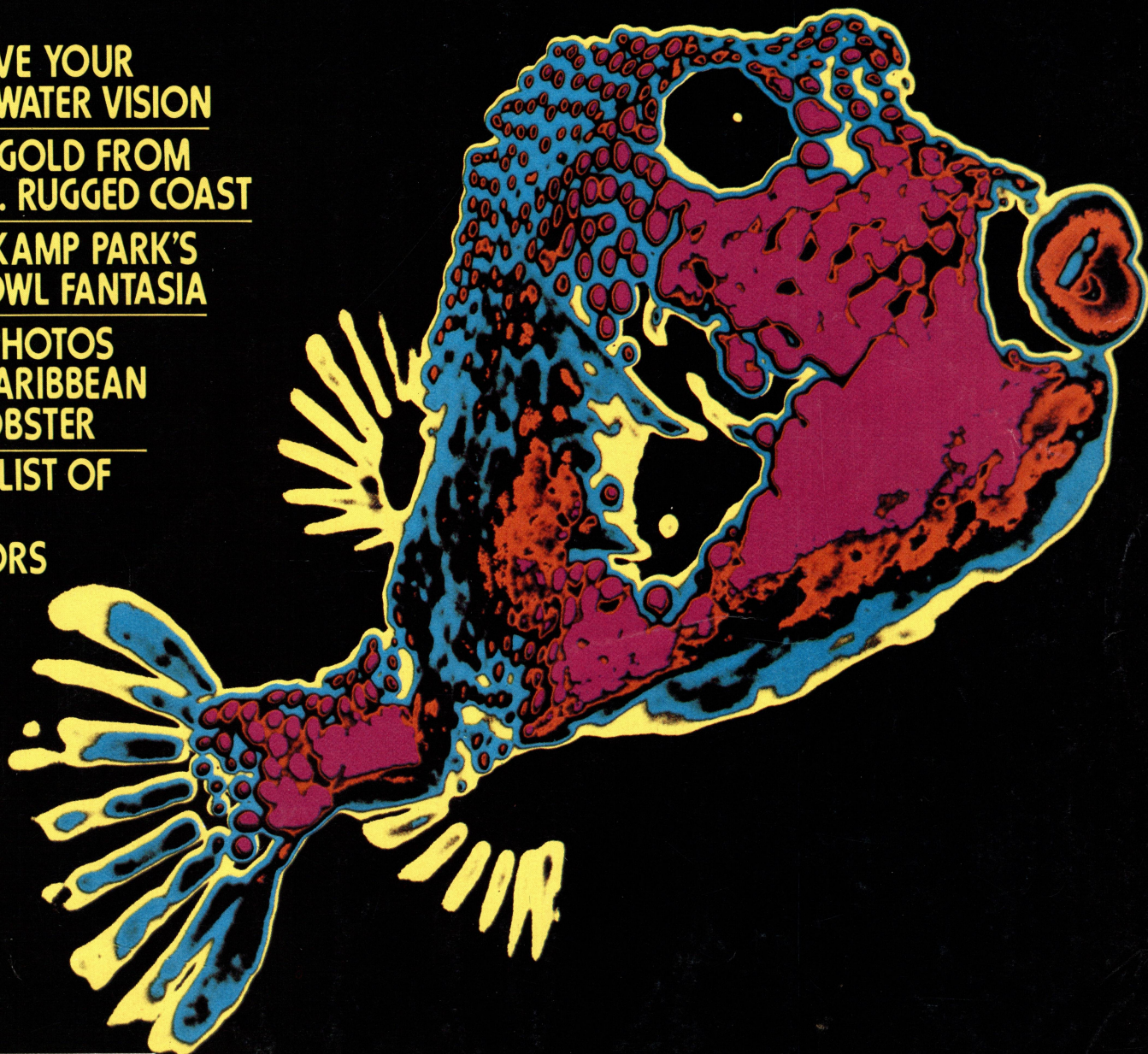
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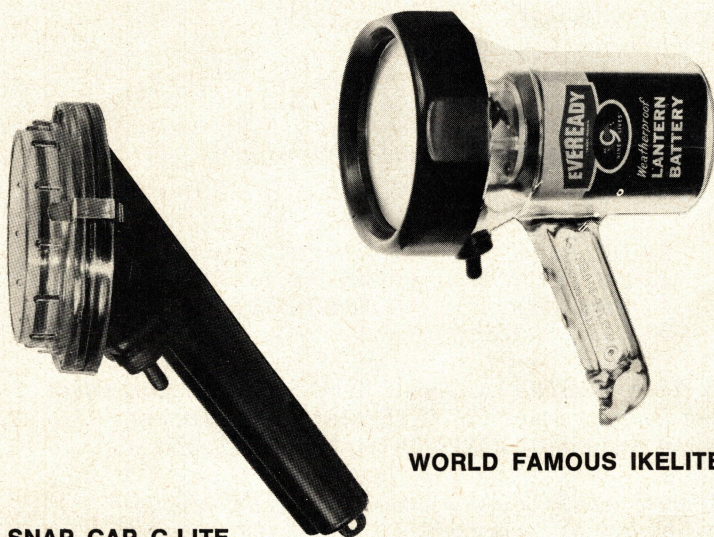


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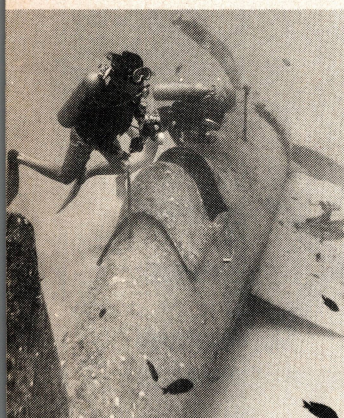
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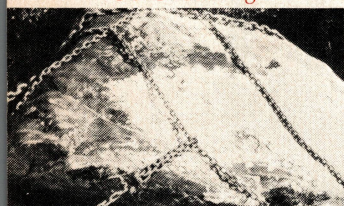
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16/See Underwater



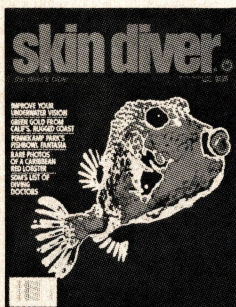
36/Ghost Flight



60/A Gem



72/Fish Fantasia



features

equipment

16 CORRECTED UNDERWATER VISION • JIM AND CATHY CHURCH
Are you seeing it all? A look at prescription lenses for scuba divers

40 AMERICAN BRISTOL'S FRESH AIR 4 • NANCY ACKERMAN
A report on their compact portable compressor

photography

34 THE ABC'S OF UNDERWATER PHOTOGRAPHY • JIM AND CATHY CHURCH
Chapter 8 – Use of strobe lighting

wreck diving

36 OAHU'S SUNKEN SQUADRON • BOB ZEHRING
Diving the wrecks of old WWII fighter planes near Pearl Harbor

scuba usa

42 DIVE UTAH • DR. N. LANGERMAN AND PAT MACILVAINE
Dive the many lakes of beautiful Utah

ocean gallery

44 THE LITTLE RED LOBSTER • BRUCE BOWKER
Rare photos of an unusual miniature bug

diving medicine

46 DIVING DOC'S • DR. BANGASSER
SDM's up-to-date list of doctors involved with diving medicine

treasure dive

60 A GEM OF A STORY • DON WOBBER
A struggle for treasured jade from California's Big Sur

travel

72 MOLASSES REEF • PAUL TZIMOULIS
Everyone's favorite reef, Pennekamp Park's fabulous fish bowl

departments

- | | | |
|--------------------|-----------------------|-----------------------------|
| 6 U/W FORUM | 20 TECHNIFACTS | 52 FISH OF THE MONTH |
| 11 SCUBA IQ | 25 INSTRUCTION | 64 MEDIFACTS |
| 13 CALENDAR | 48 NEW GEAR | 66 DIVE TOUR NEWS |
| | 50 NEWS BRIEFS | |

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cover

This month's unusual photograph of a boxfish was taken at night off Conception Island in the Bahamas by Jack McKenney with a Nikon, Kodachrome 64, 1/60 at f8 and a Honeywell strobe. The unique posterizing effect was produced by Jack Drafahl's Kritter Laboratories in Santa Barbara, California.

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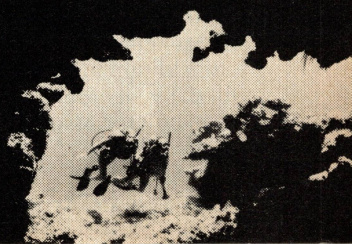
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Editorial

SPG's Adopted for Scuba Training

by the Publisher

The year 1976 may very well go down in diving history as a milestone in the evolution of scuba training. For the first time ever, all four major instructor associations have officially adopted the submersible pressure gauge as a mandatory piece of equipment for open water training sessions. In separate but similar, policy statements, PADI, YMCA, and NAUI have listed the SPG as a specific requirement for training.

Amendments to their instructor handbooks clearly specify "The use of submersible pressure gauges and/or reserve warning devices are required for all open water scuba training." This statement was reinforced with a strong recommendation for the use of SPG's in all scuba diving activities. In the case of NASDS, the mandatory use of submersible pressure gauges has been in effect for many years and there have been a number of dealer/instructor bulletins reinforcing this policy.

The use of SPG's is not new to scuba training, but '76 is the first time that it has been made *official policy* by all instructor associations. Additionally, many regional and specialized training organizations such as NACD, SSI, and the L.A. County Underwater Unit have either adopted a similar policy or have had one in effect for the past few years.

Why have all the instructor associations taken such a strong stand on the SPG? First of all, the diving accident research experts have provided a convincing argument that a high percentage of diving mishaps are directly related to "running out of air" situations. One California researcher reported that 30% of the dive fatalities he investigated could have possibly been avoided by the use of a submersible pressure gauge. He also found that 55% of the "close call" accidents reports he reviewed were in some way related to "out of air" emergencies.

In addition to the strong evidence provided by accident research programs, the instructor associations have also re-

ceived a great deal of pressure from their own member instructors who are convinced that submersible pressure gauges are crucial to scuba safety.

Why such a strong demand for mandatory use of SPG's? Here are just a few of the advantages which a submersible pressure gauge offers:

1. The SPG provides an excellent double check to insure the diver has a full tank before entering the water. Once the regulator is attached to the tank valve, the gauge is checked to make sure that it is working properly and that there is full pressure in the tank.

2. An SPG serves as an ideal "dive planner," permitting the diver to monitor his tank's air supply throughout the dive. The dive can be aborted or extended, depending upon the rate of air consumption. Guesswork is eliminated.

3. An SPG can tell the diver how much time he has left, since pressure (psi) can easily be translated into minutes remaining. Complicated mathematical formulas are not needed for determining remaining air supply.

4. An SPG also tells the diver when and where the turn back on long excursion runs. If a diver starts his dive with 2200 psi and swims straight out from the beach or boat, he knows that he will have to begin the return swim when the pressure is down to 1200 psi. In the case of cave diving, the formula established by the NACD is 1/3 total pressure going in to the cave, 1/3 total pressure coming out of the cave, 1/3 pressure for safety back-up.

5. A post-dive check of the diver's SPG, as well as his buddy's, provides a comparative analysis of air consumption rates. Knowing your buddy's air consumption and remaining air supply is just as important as gauging your own.

Does the adoption of the SPG for scuba training make reserve devices obsolete? Not in the least! There is still a strong diver demand for J-valve tanks and regulators incorporating sonic warning devices. Such devices are very much like built-in alarm clocks, and thus provide a

distinct safety function which is entirely different from the submersible pressure gauge. Divers often become so engrossed in their underwater environment, they forget to check their SPG. However, a reserve warning device is not so easy to ignore, and it virtually forces the diver to realize his air supply has diminished to the critical point. Reserve warning devices generally provide sufficient air pressure and time for the diver to safely return to the surface. The ideal safety combination is a submersible pressure gauge and either a J-valve tank or sonic regulator. With this combination, the diver is equipped with both a "fuel gauge" and an "alarm clock."

As a result of the newly announced policy on SPG's, the industry is tooling up to meet the requirement. Most dive stores and professional scuba schools have already equipped their regulator rentals and training equipment with SPG's. They have come to recognize the value of this instrument and found it to be well worth the additional equipment investment cost.

The next obvious step is for dive resort operators and diving charter boats to make SPG's a mandatory requirement just as they have done with safety flotation devices. Dive clubs and councils could also be helpful by actually supporting this nationwide scuba safety drive. It would be a valuable contribution if dive clubs would require the use of SPG's for all club dives and trips, as well as making it a requirement for valid membership.

The adoption of the submersible pressure gauge as a *primary* piece of scuba equipment has been a long time coming. Although this instrument has been around for more than 15 years, the number of gauges sold still lags far behind the number of regulators produced annually. Hopefully, this latest move will help convince the diving public of the value of this marvelous instrument, and perhaps reduce the number of dive fatalities by as much as 30 percent. 🐠

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Underwater Forum

...I have been a certified diver eight years and YMCA instructor three years. During this time, I have had the good fortune to visit Cozumel ten times and dive Palancar reef about 80 dives.

I was quite upset by February's article "Confessions of a Panicked Diver" by Thad Kusmierski. During all my dives on Palancar (the site of his near tragedy) none of the two to three hundred people with whom I dove ever suddenly became so negatively buoyant that they had a problem. And I am talking about depths often in the 100-150 foot range. Why then should the author have experienced this problem when so many others have not? The obvious answer seems to me that 90% plus of all my diving companions wore no compressible protective clothing (a sweatshirt or less usually gave enough warmth) nor did they inflate any vest or buoyancy compensator underwater. Therefore there was nothing to change their buoyancy at any depth. To quote from an ad in your same issue by a respected manufacturer of diving gear, "The instant depth is changed, the vest itself changes. It either expands on ascent and has to be partially deflated to offset the excessive positive buoyancy; or it compresses on descent and has to be partially inflated to offset the excessive negative buoyancy."

I own and teach the buoyancy compensator, but I also teach when and where not to use it. It seems to me too many courses today are teaching the use of buoyancy compensators under any and all circumstances, something many of my fellow instructors agree is a dangerous practice often overlooked. Unless Mr. Kusmierski was wearing a wet suit or is one of those very rare people who is negative in salt water without additional weight or unless he was carrying heavy objects, why should he inflate a buoyancy compensator under water?

And if he was using weight and a buoyancy compensator, how unfortunate he did not think immediately of ditching his weight when the buoyancy compensator was apparently failing him. WM. J. ARZBAECHER

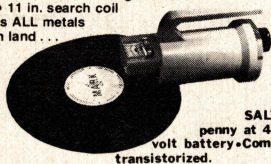
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stage. The key word is *HAD*. If you have been in this unfortunate position, my guess is that you were a little bit nervous. You may have had the thought of giving up your tank and making a free ascent. It is possible in the buddy breathing situation that your guest just may become a life-taking parasite. Instead of having the problem of trying to obtain a breath of air from your own regulator without pushing your buddy over the point of near panic to total panic, it is much easier to give your buddy your spare second stage.

I urge all divers to obtain an octopus regulator and practice using it . . . The use of an octopus rig is finally finding its rightful place as the number one safety item . . .

I have been using an octopus rig for a few years now and I feel much more comfortable around others. If more of my diving buddies used an octopus rig, I would feel much better because I would not be the only supplier on our dives.

I was extremely happy to see the editorial in the December '75 issue supporting the use of the octopus. Let us eliminate buddy breathing practices and maybe save more lives!

FRED BUTLER ST. THOMAS, V.I.

. . . the plight of the whales should be made more widely known and it should be of large interest to skin divers, like myself, who are concerned with ocean species that are now being hunted to extinction.

Dr. Harry Lillie, who witnessed a modern whaling expedition sailing as a ship's surgeon, was quoted as saying, "if we could imagine a horse having two or three explosive spears driven into it, and then made to drag a heavy butcher's truck, while blood poured over the roadway until the animal collapsed an hour or more later, we should have some idea of what a whale goes through."

I was very pleased with the May 1976 article "Vanishing Leviathans" by Bill Barada. If anyone is interested in helping save the whales, but need information as to how you can go about it, write to the Animal Welfare Institute, P.O. Box 3650, Washington, DC 20007, Christine Stevens, President.

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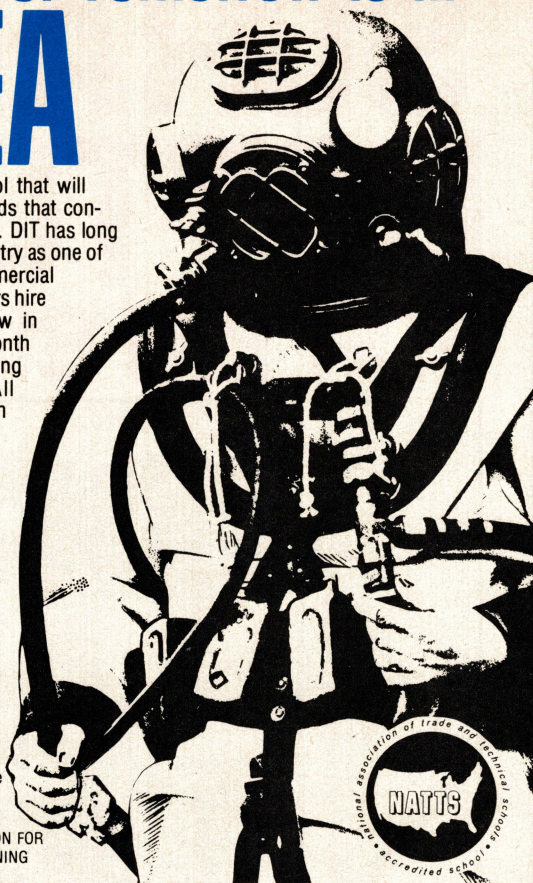
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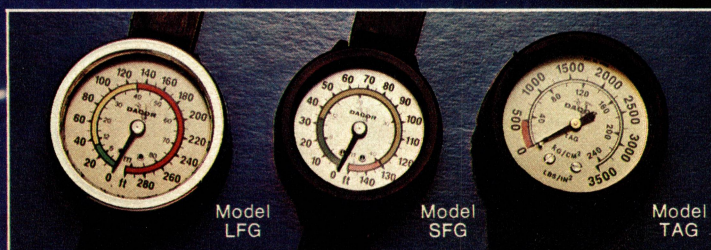
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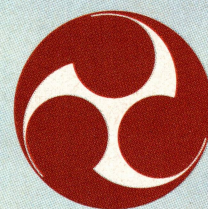


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 - ☐ A. Move in the same direction as the wind.
 - ☐ B. Are primarily predictable, major currents.
 - ☐ C. May change direction with depth.
- 2) **A current will be weakest:**
 - ☐ A. At the surface.
 - ☐ B. In mid-water.
 - ☐ C. Near the bottom.
- 3) **A rip current normally flows:**
 - ☐ A. Parallel to shore.
 - ☐ B. Away from the shore.
 - ☐ C. Toward the shore.
- 4) **Improved visibility and colder water are generally caused by:**
 - ☐ A. A wind blowing offshore.
 - ☐ B. A wind blowing toward shore.
 - ☐ C. A wind blowing parallel to shore.
- 5) **Tidal current velocity will be greatest:**
 - ☐ A. At high tide.
 - ☐ B. At minus tide.
 - ☐ C. At mid-tide.
- 6) **The greatest tidal range will generally occur:**
 - ☐ A. When the moon is full or new.
 - ☐ B. In harbors and estuaries.
 - ☐ C. Both answers A and B are correct.
- 7) **Surf is caused by:**
 - ☐ A. The bottom of waves being slowed.
 - ☐ B. Wind blowing the top of the wave over.
 - ☐ C. Earth's rotation and tidal rhythm.
- 8) **A wave will break when the depth of the water is approximately _____ times the height of the wave.**
 - ☐ A. One.
 - ☐ B. Three.
 - ☐ C. Four.
- 9) **A wave breaking offshore, reforming, and breaking again near shore could indicate:**
 - ☐ A. An offshore drop off.
 - ☐ B. An offshore reef.
 - ☐ C. A strong, ebbing tide.
- 10) **A series of small waves followed by a series of larger waves would probably be caused by:**
 - ☐ A. The wake of an offshore boat.
 - ☐ B. The rhythm of the tides and shape of the shore.
 - ☐ C. Two wave trains with different periods.
- 11) **The type of breaker which stirs up the greatest area of the bottom is a:**
 - ☐ A. Plunging breaker.
 - ☐ B. Spilling breaker.
 - ☐ C. Mare's Tail breaker.
- 12) **Backwash, or the return of water thrust upon the shore by waves:**
 - ☐ A. Is seldom felt beyond a depth of three feet.
 - ☐ B. Is more apparent on a steeply sloping beach.
 - ☐ C. Both answers A and B are correct.
- 13) **Surge, or the back and forth motion beneath the waves, will be present to a depth equal to:**
 - ☐ A. One half the distance between the waves.
 - ☐ B. The distance between the waves.
 - ☐ C. The height of the average wave.
- 14) **In the summer there is a greater amount of sand on the beach because:**
 - ☐ A. The waves have a longer period in the summer.
 - ☐ B. The waves have a shorter period in the summer.
 - ☐ C. The longshore current deposits the sand.
- 15) **A longshore current, or a current flowing along the shoreline, is caused by:**
 - ☐ A. Winds blowing along the shore.
 - ☐ B. Waves approaching shore at an angle.
 - ☐ C. Tidal currents paralleling the shore.

Scuba I.Q.

Test Your Dive Knowledge

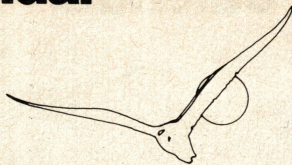
What's Your Water Motion I.Q.?

Answers from questions on page 11.

- 1) C. May change direction with depth. Surface currents tend to follow the wind direction, and major currents are generally constant; but a change in the direction of current can be experienced as the diver descends. It is not uncommon to have a surface current flowing one direction and the current at the bottom flowing in a different direction.
- 2) C. Near the bottom. Obstructions on the bottom restrict the flow of water and create turbulence, slowing the movement of water. To make headway against a current, get as close to the bottom as possible.
- 3) B. Away from shore. A rip current occurs when water accumulated on the shore from breaking waves runs off in one place rather than along the entire shore. This concentration of water is funneled away from shore through a narrow opening, creating a strong, narrow current.
- 4) A. A wind blowing offshore. A strong offshore wind moves the surface water away from shore. As this situation continues, the surface water is replaced by colder, nutrient-rich waters upwelling from the depth. Upwelling results in better visibility and increased activity of underwater life.
- 5) C. At mid-tide. At high tide, the water is slack. The current will gradually increase as the tide ebbs, reaching maximum velocity at mid-tide. The current will then gradually abate, become slack again at low tide, and the cycle will be reversed as the tide comes in.
- 6) C. Both answers A and B are correct. The tides are caused by the gravitational attraction of the sun and the moon to the earth. During certain phases of the moon the highest tides, called spring tides, occur. Tidal waters flowing in landlocked harbors and estuaries can be very large and dangerous as the water is channeled in and out.
- 7) A. The bottom of waves being slowed. As waves enter shallow water, they come into contact with the bottom. This slows the wave, causing it to peak. As the wave height builds and the top of the wave travels faster than the bottom, it finally becomes unstable and breaks.
- 8) A. One. A wave becomes unstable as the depth decreases and finally breaks at a depth equal to 1.3 times the wave height. This information on depth and much more useful information concerning diving conditions can be determined by an observing diver who is knowledgeable about waves.
- 9) B. An offshore reef. Shallow water causes a wave to become unstable and break, so a shallow offshore reef or bar will cause waves to break. The energy in the waves then continues and forms a new wave which breaks again upon the shore. A peaking of waves offshore is also an indicator of shallow water.
- 10) C. Two wave trains with different periods. When two series of waves with different wavelengths approach shore, there are periods when the wave crests reinforce, creating larger waves, and periods when the waves tend to cancel each other.
- 11) B. Spilling breaker. When a wave gives up its energy all at once, it causes the most erosion and is called a plunging breaker, but a spilling breaker is a wave which gives up its energy slowly by "spilling" all the way to shore, thus stirring up a large area of the bottom.
- 12) C. Both answers A and B are correct. Undertow is a misnomer. The normal return of water from the beach is the backwash from waves and will not be felt beyond a depth of a few feet. The backwash will be greater on a steeply sloping beach, but will still not present a problem beyond a depth of three feet.
- 13) A. One half the distance between the waves. Water particles move in a circular orbit as a wave passes through the water. This movement extends to a depth equal to one half the wavelength, or distance between the waves. In shallow water, the circular orbits are flattened due to interruption of the circular motion by the bottom. The flattened orbits are felt as back and forth motion called surge.
- 14) B. The waves have a shorter period in the summer. In the winter large waves keep the sand in suspension and carry it from the beach to form offshore bars. During the summer gentle, shorter period waves carry the sand towards shore where it settles and adds to the sand on the beach.
- 15) B. Waves approaching shore at an angle. Waves approaching shore obliquely keep pushing water along the shore, forming a longshore current. This current seldom exceeds one knot, but it is useful for divers to know the cause and effect of longshore currents.

What is your water motion IQ? If you missed two questions or less, your knowledge is excellent. If you missed more than three, we suggest you study the movement of water to make your diving easier and safer. When you know how water moves and why, you can make it work for you instead of against you. Next month: Search and Recovery.

Calendar



September 1

Entry deadline, NAUI North Atlantic Waters Photo Contest. (Contact: local north-east dive shop or Gene DeMarco, 34 Hancock Ave., Medford, MA 02155)

September 12-15

Oceans '76 Conference & Exposition, Sheraton Park Hotel, Washington, D.C. (Contact: Oceans '76, Technical Progr. Chmn. MTS-IEEE, Suite 412, 1730 M St., Washington, D.C. 20036)

September 13

Marine Technology Society Film Festival, Sheraton Park Hotel, Washington, D.C. (Contact: Barbara MacLeod, P.O. Box 1675, Galveston, TX 77550)

September 17-18

12th Annual San Diego Underwater Film Festival, San Diego Civic Theater. (Contact: Tom Southard Jr., 4130 Park Blvd., San Diego, CA 92103)

September 18

NAUI Underwater Film Review, John Hancock Hall, Berkeley St., Boston, MA., 8 p.m. (Contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, MA 02117)

September 24-26

Dive Mark 76 2nd Annual Scuba Instructors Convention, Rockport, MA. (Contact: John R. Burrage, 74 E. Main St., Hopkinton, MA 01748)

September 25

Underwater Film Festival & Seminar, Washington, D.C. (Contact: Int'l Ocean II, Inward to the Sea, Box 41010, Washington, DC)

September 25

5th Inward to the Sea, Lisner Auditorium, George Washington University, Washington, D.C. (Contact: Inward to the Sea, P.O. Box 41010, Washington, DC 20014)

October 1-4

Man and the Sea 1976, Chevron Hotel, Sydney, Australia (Contact: Man and the Sea, P.O. Box 40, Spit Junction, N.S.W. 2088, Australia)

October 9

Seamark '76, New England Aquarium, 7:30 p.m. (Contact: Tony Salerno, 105 Beech St., Fitchburg, MA 01420 (617) 343-3526)

October 29-30

Underwater Film Festival & Photo Contest, Honolulu, HI (Contact: Roy Damron, 954 Kului Palace, Honolulu, HI 96821)

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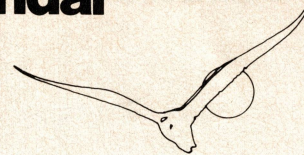
Mail order purchase of life support apparatus
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training and certification.



NEW ENGLAND DIVERS

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Calendar



November 1

14th Annual International Underwater
Photo Competition (Contact: Underwater
Photographic Society, P.O. Box 7088,
Van Nuys, CA 91409)

November 5-7

8th International Conference on U/W Edu-
cation, San Diego, CA (Contact: NAUI
Hdqs., Box 630, Colton, CA 95490)

November 6

IQ8 Film Festival, San Diego, CA (Contact:
NAUI Hdqs., P.O. Box 630, Colton, CA
92324)

November 7-11

1st International Meeting on Underwater
Activities, Eilat. (Contact: Red Sea Un-
derwater 1976, P.O. Box 29234, Tel Aviv,
Israel)

November 13-14

Florida Skin Divers Association annual
meeting, Jacksonville, (Contact: Skip
Elmes, Bold City Divers, Inc. P.O. Box
52171, Jacksonville, FL 32201)

January 5-8

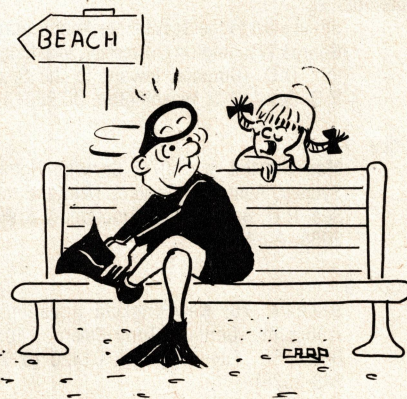
8th Int'l Conference on U/W Archaeology,
Government Conference Centre &
Chateau Laurier Hotel, Ottawa, Ont.,
Canada (Contact: Jervis D. Swannack,
1600 Liverpool Court, Ottawa, Ont.,
Canada)

January 15, 1977

Inland Divers Association 4th Annual Film
Festival & Underwater Photography Con-
test. (Contact: IDA, Doris Williams, 6215
Dodson Ter., Ft. Worth, TX 76135)

March 5

Boston Sea Rovers '77, Boston, MA (Con-
tact: Bunky Hodge, 174 Beech St., Rock-
land, MA 02370)



*"I'd bet if you let a princess kiss you,
you'd turn back into a prince again..."*

Sea Horses

A diver is shown underwater, viewed from above, using a large, orange, cylindrical Diver Propulsion Vehicle (DPV). The diver is wearing a mask and snorkel. The DPV has a black 'F' logo on its side and a large circular light at the front. Bubbles are visible around the diver's head.

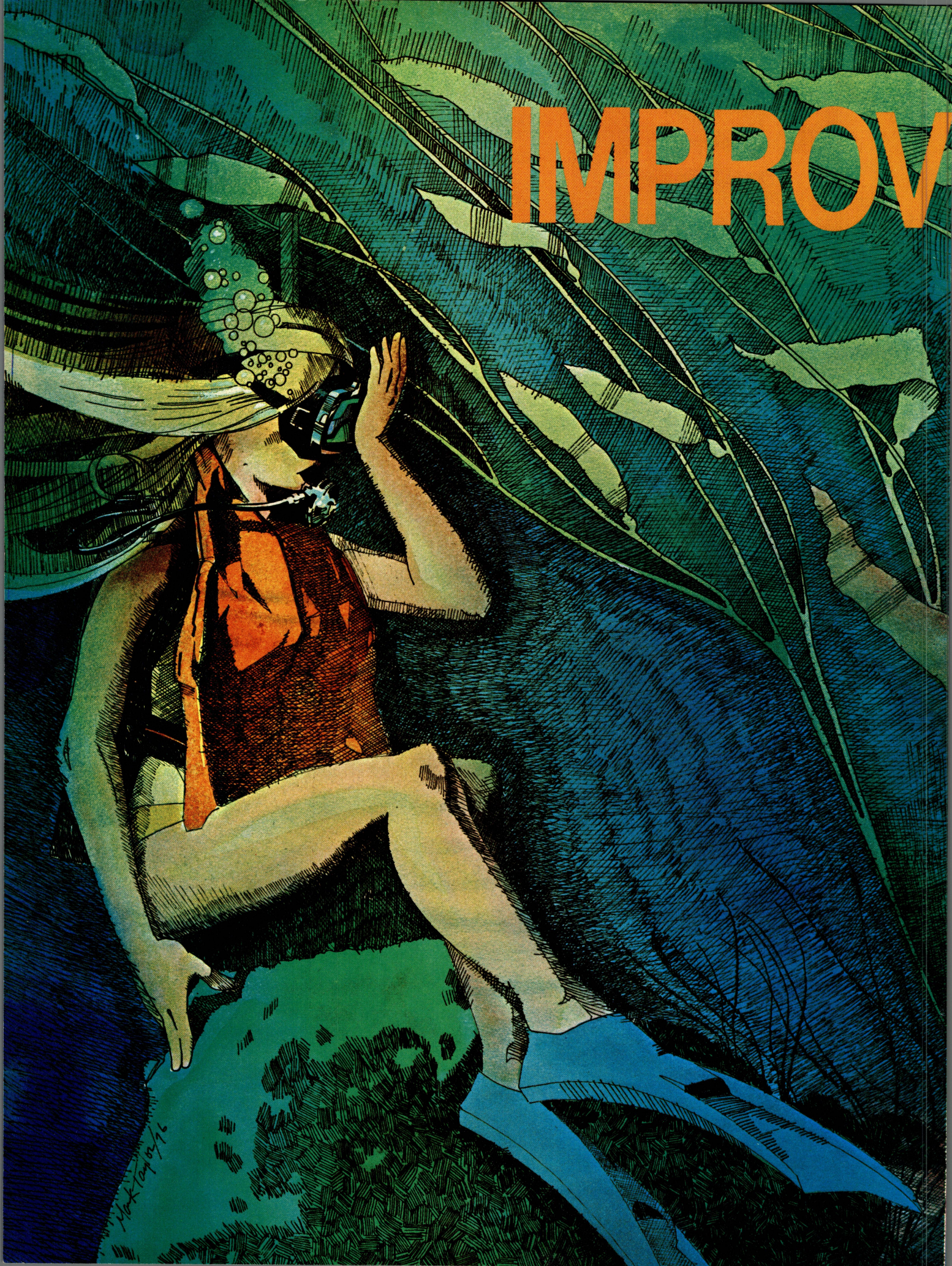
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IMPROV



TEST YOUR VISION

Look at prescription lenses for Scuba Divers

By Jim and Cathy Church

Corrected U/W vision becomes much more important when you take up one of the more specialized aspects of diving. If you are interested in marine biology, you can hardly appreciate the beauty of a tiny marine creature if you can't see its delicate details. Likewise, if you are an U/W photographer and can't read your exposure meter and camera settings comfortably, you will spend more time fighting your equipment than composing pictures. Generally (in our opinion), anyone who needs glasses to see more clearly — especially to read — should consider the advantages of a dive mask fitted with prescription lenses.

The first step in getting a prescription mask is to visit your vision specialist for a complete eye examination. Explain your U/W vision needs during this examination and request a written prescription. The second step is to decide from which of the several prescription facemask services you wish to order. If you have special vision problems, write to these companies and explain your needs along with a copy of your prescription. The third step is to select a comfortable mask in which the prescription can be installed. If you are an U/W photographer with a housed SLR camera, avoid masks with protruding purge valves which may prevent you from getting your faceplate close to the housing viewing port. Fourth, read your selected company's advertisement and brochure carefully for exact ordering instructions.

In preparing this article, we tested samples of four different methods of correcting U/W vision: (1) a goggle type mask with prescription lenses, (2) a mask with the prescription ground into the inside of the faceplate, (3) several masks with lenses bonded to the inner faceplate of the mask, and (4) a lens system mounted in a frame inside the facemask. In each case, either Jim or Cathy actually tested the products underwater. The result of these tests will constitute the balance of this article.

Dacor Optivision Lens Kit — This system consists of a kit of various lenses which can be installed in the special Dacor Vedo DM-19, goggle style mask by dive shop personnel. The lenses are hand pressed into the mask with press-fit rubber gaskets and are easily installed or removed. Thus, the customer has the advantage of quick service at dive shops offering the Optivision service. If the shop has a pool, the

Illustration by Mary Taylor

customer can get into the water for a check on the accuracy of the prescription.

The Optivision is designed to correct for far or nearsightedness. Other vision problems — such as astigmatism or prism correction — will require other methods. To purchase a Vedo DM-19 mask with corrected lenses, the customer must first go to his vision specialist and obtain the needed plus or minus diopter prescription. When the customer takes this prescription to the dive shop, the lenses matching this prescription can then be installed into a mask.

In testing the mask, Jim found that it fit snugly without leakage or fogging. Because the lenses are recessed slightly, he could press the mask up against the viewing port of his Hydro-35 camera housing with ease. While the field of view was about three-fourths of that of the other systems tested, he did not feel that this was a significant disadvantage because people who habitually wear glasses tend to turn their heads rather than just shifting their eyes when viewing a scene.

Scubapro Optical—The Scubapro Optical mask can be used with any one of a series of 20 corrective faceplates designed to correct for nearsightedness. The correction is ground directly into the inside surface of the faceplate. The available corrections begin with minus one diopter and continue — at half-diopter intervals — up to minus ten diopters. Scubapro estimates that this range of corrections can provide corrected U/W vision for about 80 percent of those divers who wear glasses. To purchase a Scubapro Optical, the diver obtains his prescription and takes it to his local Scubapro dealer.

When Cathy tested the Scubapro Optical, she found that the recessed purge valve allowed her to press the faceplate up against the viewing port of her camera housing. The prescription area — about 2¼ x 2¼ inches at the widest and highest points — proved to be comfortable to her eyes, and the fit and watertightness of the mask were excellent. Although she had no fogging problems, Scubapro does have a "Mask Anti-fog" tissue to prevent fogging as well as to clean the glass surfaces if they are oily or dirty.

Bonded Lenses — Another popular method of correcting U/W vision is by bonding corrective lenses directly to the faceplate of the mask — usually on the inside. Bonded lenses can be made for both single-lens and bifocal corrections, and can be used for correcting nearsightedness, farsightedness, astigmatism and prism correction. In addition, these lenses are ground so their optical centers match the interpupillary distance of the individual customer. Although there may be some individual differences in vertex distance (the distance from eye to lens) the prescription will be adjusted accurately enough for comfortable use during the short periods of time that the

mask is worn. Depending on the style of mask selected, the lenses may be as wide as 72mm which yields an excellent field of view. Generally, any non-laminated, glass faceplate other than goggles will accept bonded lenses.

A new set of bonded lenses may be prone to fogging. We found that Fog-Away Compound A-3 (\$5.88, Albert Industries, 140 West 36th Street, New York, NY 10018) kept the inside surfaces of the lenses and faceplate clear. If anti-fogging compound isn't available, gently scrub the rear surfaces of the lenses with a soft cloth, warm water and a small amount of household cleanser. We've been told that this damages the lenses, but have used this emergency method in the past with good results. Afterwards, use the "spit and rinse" treatment.

The bonded lenses tested were supplied by A. S. Newton, O.D.; Benson Optical Company; Dr. Leonard Maggiore and Underwater Vision, Inc. Each of these companies bonded Jim's prescription into a new mask supplied by U.S. Divers for our testing. The individual test reports are as follows:

A. S. Newton, O. D. — Dr. Newton (575 West 6th Street, San Pedro, CA 90731) offers bonded lenses to correct for the vision problems stated above in either single-lens or bifocal corrections. He analyzes each order for the proper modification of the prescription for changes in the vertex distance and has assured us that each lens is centered for exact interpupillary distance.

Dr. Newton recommends that you select a mask at a professional dive shop, but he can provide a mask if necessary. Several masks are shown in his brochure. Generally, he can fit lenses into any mask other than goggles that has a flat, non-laminated glass faceplate. While his lenses are guaranteed not to separate in use, his laboratory can remove the lenses for rebonding to another faceplate if desired. Dr. Newton reports that his lenses have been used by the U. S. Navy training facilities and many state fish and game departments.

The prescription Jim tested was bonded to a U. S. Divers Equi-Purge model F, #5208 mask. The relatively large oval area of this mask allowed Dr. Newton to install large lenses without having to reduce the lens area to accommodate a purge valve. The lenses measured approximately two and a half inches in height and two and three eighths inches in width. In both pool and ocean testing, the mask and prescription were comfortable to use.

Benson Optical Company, Inc.

— The manager of the Park Avenue office (1812 Park Avenue, Minneapolis, MN 55440) reported to us that Benson Optical Company attaches Rx lenses to nearly all types of masks, and that the bonding is guaranteed for all depths and temperatures. He added that they have

masks in which the bonding is 20 years old and still in good condition.

The lens size depends on the mask selected — the largest being 71mm (about two and three quarters inches). The lens shape is usually rounded or oval with a cutback when necessary to fit around the nosepiece or purge valve. Every effort is made to accurately grind and place the lenses to match your true spectacle correction. Occasionally, in some types of masks, when the prescription is for lower Rx powers, the prescription is ground directly into the faceplate. The customer can order directly from Benson Optical Company, or it can be ordered for the customer by the customer's own personal eye doctor.

Jim tested Benson Company's bonded lenses in a U.S. Divers Aqua-Naut model #5055 mask. Because of the narrow height of the faceplate, and the upward contour of the plate for the diver's nose, the largest Benson lenses couldn't be installed in this particular mask. However, both the fitting of the lenses and the style of the facemask combined to form an attractive prescription mask. The lenses measured approximately two inches in both height and width, and provided excellent vision during underwater testing.

Leonard Maggiore — An optician for divers, Dr. Maggiore (1702 Gates Avenue, Brooklyn, NY 11227) has been providing prescription lenses for divers throughout the United States, in many foreign countries, as well as for divers in the military services.

He requests only that you send him your lens prescription and interpupillary distance. He can provide a mask, or will have the lenses bonded into a mask you mail to him. We sent him a U.S. Divers Wrap-Around model A. #5026 — the exact model which he has shown in his monthly advertisements in SKIN DIVER. We felt that if he chose this particular mask for his advertising, then it must be well suited for his bonded lenses.

We were right. Jim was pleased with the fitting of the lenses within the mask and the mask itself. His underwater testing confirmed that this was a good combination. Although the lenses were partially cut away to fit around the high nosepiece of this mask, the lenses measured approximately two and three quarters inches in height. A smaller mask would necessitate smaller lenses.

Underwater Vision, Inc. — The Venice Eye Clinic (950 Cooper Street, Venice, FL 33595) reported that they can bond lenses in any mask on the market with the exception of plastic faceplates. In addition to bonding lenses in facemasks, their lenses can also be bonded to specialized camera equipment and housings. They once did a special bonded lens for Dimitri Rebikoff.

For highly myopic eyesight (−6.00 or more) Sondra Williamson, the Clinic Manager, recommends that a low-

volume mask not be selected as the diver's nose may rub against the lenses because of the thickness of the lens. In addition to single and bifocal corrections, she stated that special 25mm diameter lenses from +1.00 to +4.00 can be bonded at the outer corner of a faceplate. This magnifying spot is a near reading position correction. It is for divers with fairly normal vision who desire an aid for reading camera dials, watches and other such equipment.

razor blade and transferred to another mask. Likewise, the prescription lenses can be removed when the mask is packed in a loaded gearbag. (2) The Scuba Spec approximates the position and tilt of regular eyeglasses. This eliminates peripheral aberration-distortion at the edges of the lenses. (3) Because of the position of the lenses, our personal optometrist (Dr. Neilson, Gilroy, CA) indicated that the Scuba Spec could probably correct extremely severe vision



Jim Church illustrates importance of corrected U/W vision for photographers.

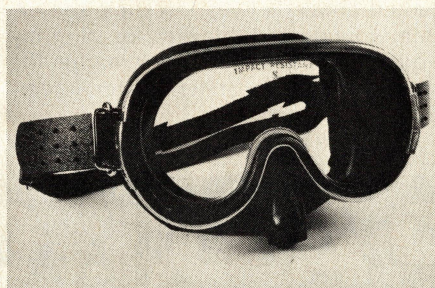
Jim tested a bifocal prescription installed in a U. S. Divers Atlantis B. #5051 oval mask without purge valve. The primary lenses were well spaced in the large, oval face plate. They were contoured with a maximum diameter of about two and five eighths inches. The smaller secondary lenses for close distances were also well placed and easy to use. The Venice Eye Clinic prescription and the U. S. Divers Atlantis mask form a good combination for U/W photographers who do not desire a protruding purge valve.

Scuba Spec — The Scuba Spec Company (P.O. Box 3346, Sta. A, Savannah, GA 31403) has a system consisting of prescription lenses mounted in a nylon frame. The frame attaches to an anchor bar cemented to the inside of the faceplate of the mask. The lenses and frame are easily attached and detached from the anchor bar, and two anchor bars are provided with each prescription so the lenses can be used with an additional mask if desired.

The Scuba Spec System has three distinct features: (1) If the mask is damaged, the anchor bar can be removed with a



Dacor Vedo Model DM-19 mask. Lenses by Optivision installed at dive shop.



Scubapro Optical has your prescription ground directly into the faceplate itself.

problems more accurately than the other products he had examined for us.

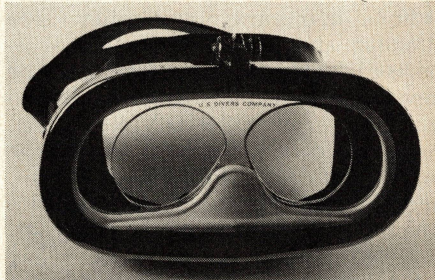
Dr. Shedrow, President of Scuba Spec, indicated that while a diver can order a Scuba Spec by sending in his prescription, the diver's personal vision specialist can handle the entire transaction. The Scuba Spec is sent with directions for installation and can be installed easily at home. Jim installed his correction in a U. S. Divers Pacifica E. #5050.

Underwater, Jim found the vision correction to be excellent. The frame holding the lenses did not come loose or wobble during his dives, nor could he dislodge it by shaking the mask violently by hand. An application of Fog-Away eliminated fogging problems.

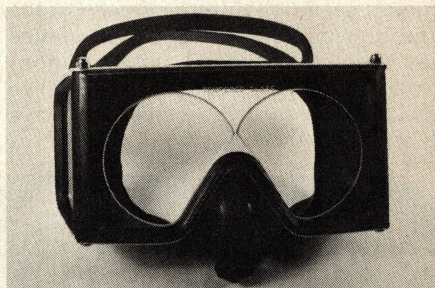
Conclusion — It is impossible for us to completely describe the full potential of each of the companies discussed for correcting special vision problems. This would exceed both the scope of this article and our limited background in this field. Rather, this article was written to provide an introduction to corrected U/W vision. For more information, see your personal vision specialist and write directly to these companies. 🐠



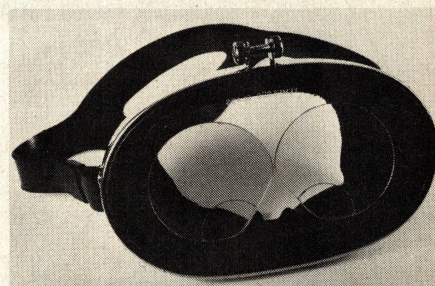
U.S. Divers Pacifica E. 5050 mask with the prescription lenses by Scuba Spec Co.



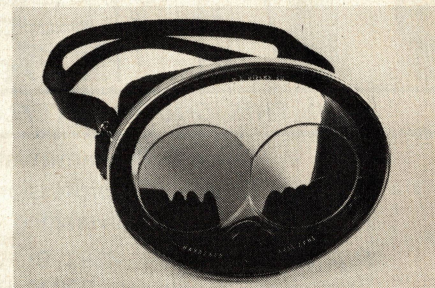
U.S. Divers Aqua-Naut 5055 mask with Rx lenses by Benson Optical Company.



U.S. Divers Wrap-Around 5026 mask with prescription lenses by Dr. L. Maggiore.



U.S. Divers Atlantis 5051 mask with Rx lenses by Underwater Vision, Incorporated.



U.S. Divers Equi-purge 5208 mask with Rx lenses by Dr. A. S. Newton, O.D.

Technifacts

from a Master Diver

BY E. R. CROSS



The basic purpose of this column is to stimulate an interest in the technical aspects of diving and dive safety. It will be devoted to providing factual answers to questions from SKIN DIVER readers. Answers will be designed to apply to the majority of diving situations, problems, and equipment encountered in today's diving. Single subject questions are best suited to Technifacts and may be on any subject related to diving. Watch for your answers in Technifacts.

Questions from Technifacts' readers emphasize one subject for a while then interest seems to shift to others. For the past several months, correspondence has been predominately about various aspects of aquatic medicine and of dive accidents. Many of these questions have dealt with injuries from venomous

marine animals. One of the questions received dealt specifically with the use of meat tenderizer for treatment of sea urchin and other marine life stings. This reader wrote, "During 19 years of diving, I thought I had heard all the favorite home remedies for wounds that divers commonly get. Recently though, I heard one that was completely new to me. For puncture wounds from sea urchin spines or a sting ray's sting, apply meat tenderizer. I am writing to find out if there is anything to this remedy."

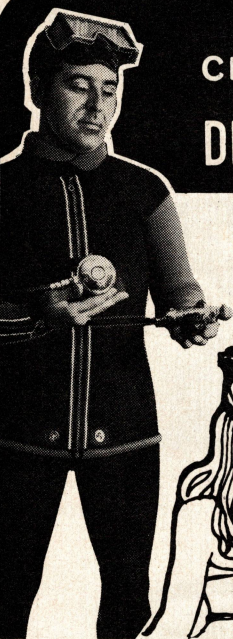
The answer to the specific letter quoted above is "yes" to some sea urchin wounds and "never" for sting ray wounds. But there are many marine life injuries where meat tenderizer is certainly recommended.

I, too, had heard of this first aid remedy

for years but had never tried meat tenderizer for sea animal wounds. Several divers with whom I talked had used it and reported good results in most cases. In researching for published use or recommendation I found little available information. However, based on the experience of divers and on some clinical use by qualified persons, the following seems to be the present thinking on treatment of some venomous marine animal injuries and, specifically, the use of meat tenderizer in their treatment.

Stings from jellyfish, some types of corals, and sea anemones are sometimes potentially hazardous. Symptoms and signs of stings by these animals will vary with the species and the extent of contact with the animal and, in some cases, with the reaction by the individual stung. Symptoms may be no more than an itchy sensation but can also be an intense throbbing pain which can result in unconsciousness. Almost always there will be a reddening of the area. These minor symptoms or signs may or may not be followed by nausea, vomiting, cramps, numbness, choking sensation, loss of speech, paralysis, convulsions, and shock. Parts of the animal, such as tentacles or polyps, are often found in the affected area.


Since the diver may have breathing difficulties or may become unconscious, he should be removed from the water as



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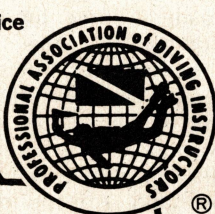
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quickly as possible. This also permits additional treatment as may be required. Remove the animal stinging parts (tentacles or polyps) being careful not to come in contact with them yourself. They can still sting.

The poison in these types of marine animals is protein in nature. The best detoxification is by meat tenderizer which denatures the protein. The wound, or wounds, should be cleaned with antibacterial soap if this is available. When dry, apply antihistamine cream or cortisone or a special anesthetic ointment. If these are not available, apply olive oil, sugar, or ethyl alcohol. Keep the patient lying down with feet elevated, and be prepared to apply artificial respiration if required. It is always advisable to call for qualified medical help.

If it is determined that the diver came in contact with Portuguese man-of-war (found in both Atlantic and Pacific waters) or the sea wasp (found in the South Pacific waters, particularly around northern Australia) get the services of a medical doctor as quickly as possible. The sting of these creatures are often very severe, particularly those of the sea wasp which has caused many deaths.

Coral wounds, as opposed to coral stings discussed above, can also be treated with meat tenderizer. Again this is primarily to denature the protein in the polyps in the wound. Since coral is cov-

ered with large amounts of bacterial growth, soap and water washing and flushing is helpful. Then follow first aid procedures outlined previously for other marine life stings.

I would think the proper order of various first aid procedures would be: first, remove any remaining tentacles or polyps as quickly as possible. Then apply meat tenderizer to detoxify the protein poison. Next, to relieve pain, apply, if available, the anesthetic ointment and give the oral antihistamine. When the pain has subsided, or if the pain can be tolerated, wash the affected area with the bacterial soap, or other washing agent, followed by the application of cortisone or antihistamine ointment. The object of first aid for marine animal stings is to remove any stinging particles to prevent further stinging; detoxify the poison that has been injected or that is in remaining stinging particles; then to prevent or reduce pain that might cause shock. Washing and application of medicines prior to these first aid measures might cause or intensify pain and lead to shock that might not, otherwise have occurred.

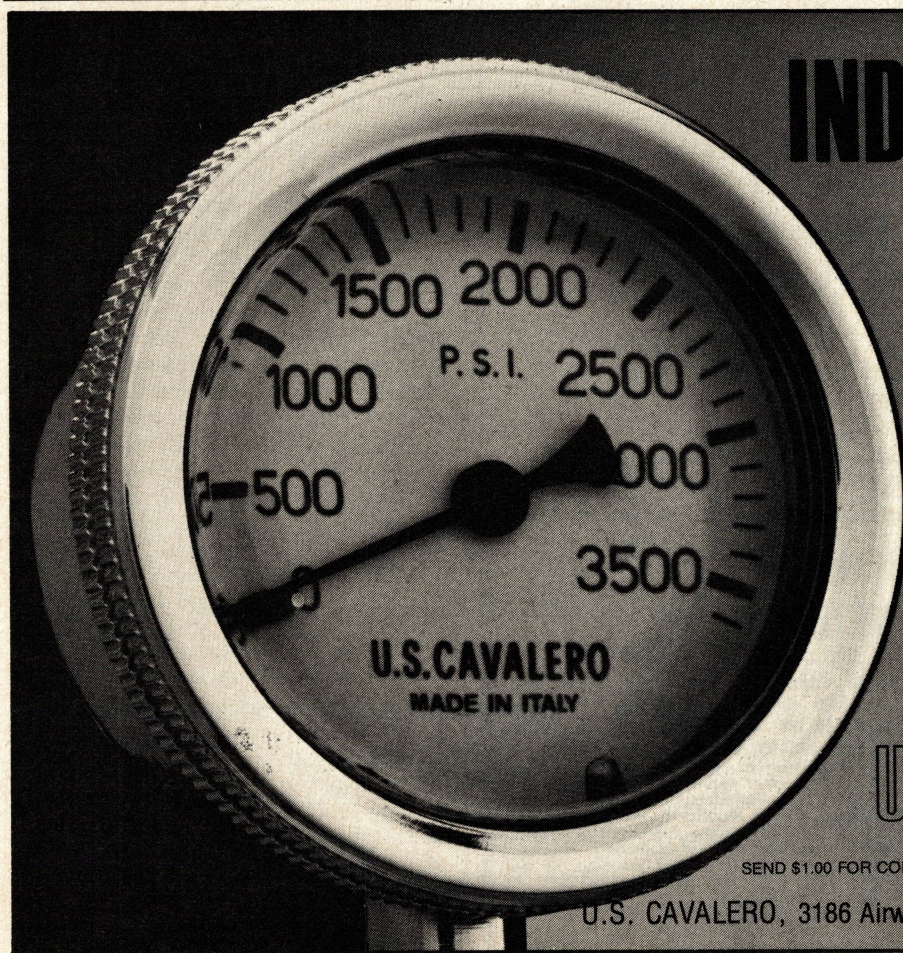
In sea urchin spine wounds there is usually no injection of poison. There is almost always an immediate sharp, burning pain followed by redness and swelling. First aid measures include removing those spines that can be grasped with tweezers. Attempts to remove broken

spines with a needle will usually only make matters worse. Most urchin spines will dissolve in the body in a week or ten days. Pain usually subsides in a matter of hours. However, soreness may persist for two or three days. Some forms of sea urchins have small pinchers at the ends of the spines. In those cases first remove the pinchers and then apply meat tenderizer to the wound. Then follow first aid measures for the stings.

The puncture wound of the sting ray is completely different and meat tenderizer (a protein detoxifier) will do little if any good in those wounds. The sting of a ray injects the only known alkaline poison which is found in the sheath around the barb. This injury alone (from marine animals) should be treated with a weak acidic solution such as vinegar.

Puncture wounds can be inflicted by other poisonous marine animals such as cone shells and a variety of rock and sand dwelling fish.

Some cone shells are very toxic and there are records of their causing death in humans. Probably the most poisonous are the marbled cones (*Conus marmorus*, *C. nicobaricus*, *C. vidua*, *C. bandanus*, and *C. crosseanus*); the tent marked cones *Conus gloriamaris*, *C. textile*, *C. dalli*, *C. omara*, and others); the striated cones (*C. striatus* has the dubious honor of the most human fatalities, *C. floccatus*, and *C. terminus*); and at least one of the



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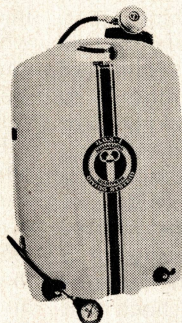
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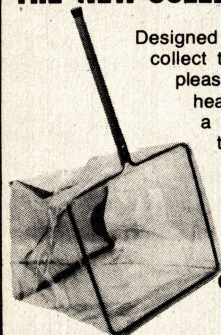
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subgenus *Gastridium*, *C. geographus*, which has also been blamed for several human deaths.

Apparently all cone shells have a poison radula (stinging barb) and poison sacs. In some species the radula is very small, even though the shell is quite large (such as *C. spiceri* found in Hawaii) and the poison sac is correspondingly small. In others the radula tooth or dart is large and the gland also very large. The largest poison dart I have found in dissected cone shells was found in a large specimen of *C. gloriamaris* from the Philippines and one equally as large (but of different structure) found in a large specimen of *C. striatus* collected in Hawaii.

To avoid stings from cone shells, handle them as little as possible and then only by the base or large end. Do not tuck them under bathing suits, or inside wet suits. Do not place them in bags that can hang down against your body; do not leave them where children can get them.

Besides cone shells, many fish in the sea are venomous. Mostly the venom is found in fin spines, but some have injury producing spines in other parts of their bodies — such as heads or tails.

Scorpionfish are the most widespread of the poisonous fish. The stonefish (the feared *nohu* in Polynesian waters but found throughout west tropical Pacific and Indian ocean waters) has one of the most potent stings of the stonefishes and has caused deaths in humans. The sculpin, also a scorpionfish, of both East and West Coasts of North America, but particularly in Southern California, has caused many injuries to divers. The venom of the beautiful lionfish is also very potent and can inflict a serious wound. Remember, these are not just injuries, the result of a dart being jabbed into the diver. Poison has been injected through a hollow spine by pressure on a poison filled bulb on the side of or at the base of the barb or spine.

Most of these fish are sedentary creatures and do not bother divers. Usually they are the ones that are bothered by the curious or careless diver. It is not usually the fish that generates the force required to drive a barb into the flesh of the divers — but the divers themselves. The result is, of course, the same. There is a wound by a poisonous marine animal.

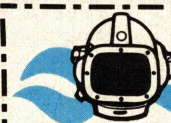
Such wounds are sometimes as toxic as those from a poisonous snake. And also very similar. They will be puncture wounds and will require first aid measures. First symptoms are usually extremely intense local pain followed by fainting and weakness. The pain level

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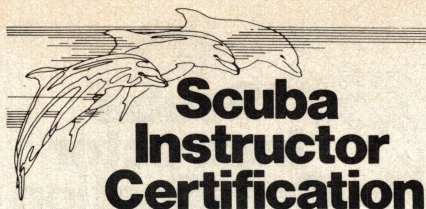
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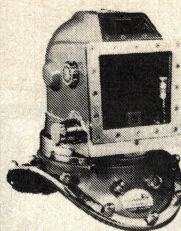
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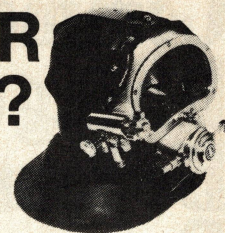
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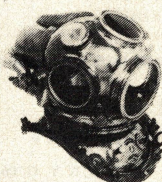


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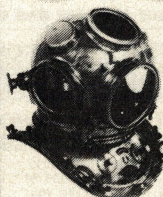
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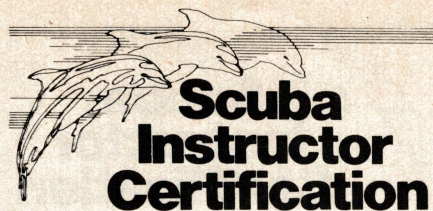
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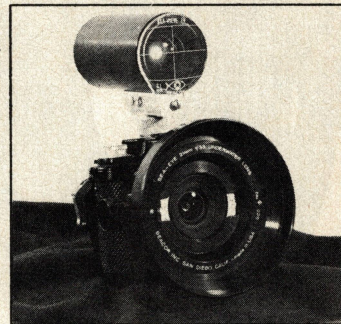
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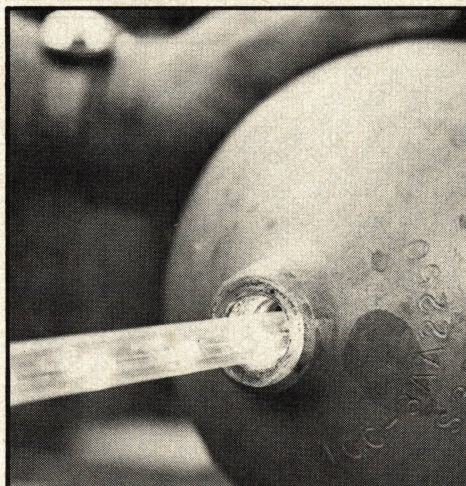
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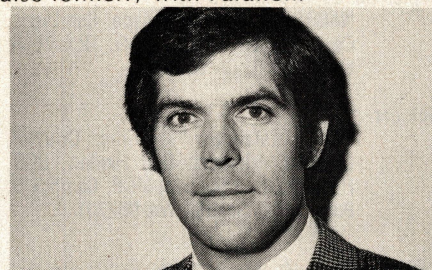
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Tekna, New Dive Product Co.

Ralph Shamlian and Hank Fagundes, the former founder and operations manager, respectively, of Farallon Industries, have formed a new company called TEKNA. Joining them in their new venture are Sherry Burr, procurement manager, and Gary Heller, sales manager, also formerly with Farallon.



At 30 years of age, Ralph Shamlian has already gained a reputation in the dive industry as a prolific inventor, holding half a dozen patents on a broad range of devices from moldable snorkels to dive instrumentation. Shamlian has also been an outspoken critic of outsiders who have attempted to regulate the sport of scuba diving.

"Tekna," says Shamlian, "is a team of individuals dedicated to new directions in creativity and design excellence. We believe that form should be a harmonious partner to function in equipment design. There is no reason why style and reliability shouldn't go hand in hand."

Tekna designs and manufactures all of its products "in house" in a modern plant in Menlo Park, California, in order to best control quality and delivery. The first product is an exotic, light weight, low volume wrap-around mask followed by a uniquely different snorkel, and then on to a whole array of distinctly designed diving equipment.

Florida Shop Receives PADI Award

Divers Unlimited of Hollywood, Florida was recently selected by PADI as the number one training facility in the entire nation. "No secret", claims Dave, "we simply have a job to do and we try our best to do it well. We put a great deal of time and effort into our diver training programs, and a great deal of pride as well. In most cases we are the first contact a new diver has with this sport. He places a great deal of trust in our hands and we have to be equal to the task. We train a large number of divers; but the accent is always on quality of education, not on quantity of students."

Accepting the PADI award are three of Divers Unlimited's instructors: Al Troop, Burt Culver, and Dave Inman. Al has been an instructor for two years, and hopes to become a PADI Master Instructor before the summer ends. Burt graduated from PADI College a year and a half ago. Dave, who is also Director of

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Training at Divers Unlimited, has devoted his life to diving for the past twenty years. He served with the U.S. Navy Diving Team before becoming a commercial diver. Today Dave continues his career as a PADI Master Dive Instructor; training sport and commercial divers, rescue squads and fire departments, as well as other PADI dive instructors.

The basic dive course at Divers Unlimited consists of a full forty hours of training. There are five pool sessions in an olympic sized pool covering everything from snorkel clearing to buddy breathing to ditch and don. The five classroom sessions are filled with lectures, films, and visual aids. The students cover text book material from Boyle's Law to the decompression tables, and are assigned regular homework. As the course progresses, the students are first introduced to the ocean on a class snorkel run. This is followed later in the class with a full scuba beach dive. Graduation is in the form of an all-day checkout dive from a boat in the Florida Keys. Students must also pass a thorough written exam. If he successfully completes all phases of the course then, and only then is he awarded his C-card.

If there is one "secret" to a successful diver training program, it has to be the instructors. They are the backbone of the Divers Unlimited program and the key to its success. A good diving instructor must be an excellent diver but he must be an excellent teacher as well. He must be able to relate to his students and gain their trust and confidence.

As Director of Training Dave Inman explains, "We are very fortunate to have such top notch instructors here at Divers Unlimited. I say fortunate, and not lucky, as I always knew the type of individuals I wanted. The trick was in finding them.

So if you are still wondering what the secret is to running a good diver training program, just ask Dave Inman. He will shrug his shoulders and say "There's no secret to hard work and devotion." 🐠

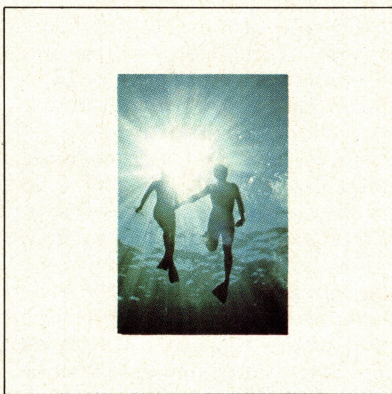
Parkway Moves to New Headquarters

Parkway Fabricators, Inc. and its Poseidon Systems Division, (makers of the Unisuit and other professional underwater products) have consolidated operations at a new 30,000 sq. ft. headquarters on three acres in South Amboy, N.J. The building, now in full production, is designed for easy future expansion, and has facilities for manufacturing, warehousing, and a special section for research and development, with responsibility for strict quality control and development of new products to keep pace with the growing needs of the underwater industry.

A subsidiary of Great American Industries, Parkway Fabricators, Inc. new address is 241 Raritan Street, South Amboy, N.J. 08879. 🐠

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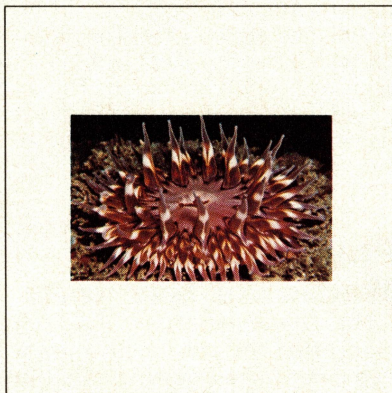


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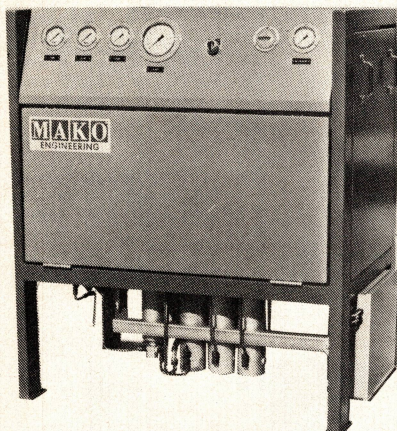
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New Kansas Dive Center Opens

Three Wichita, Kansas diving instructors announce the opening of a new full service diving facility for Kansas divers. Midwest Diving Center, Inc. is located in the Parklane Shopping Center, at 1107 Parklane, Wichita, Kansas. The owners are James Sheldon, ex Navy diver and YMCA-PADI Instructor, Don Fey, YMCA-PADI Instructor, and Ellen Murphy, YMCA Instructor.

The goal of the new operation is to provide a complete one-stop source for all diving needs, and service by people who know diving, and care about divers. Instruction is handled by a staff of five instructors. Classes include basic, advanced, and many specialty programs. An in-store travel center allows the diver to arrange trips to any part of the world.

The Center offers a new low-cost Tank Inspection Program, the TIP sticker, to promote regular internal tank inspection by all divers. Air supply at Midwest Diving Center is provided by a 14 cubic foot water cooled Worthington, with 2 other compressors in reserve. The air bank is maintained at 3400 PSI. This new facility, with a fresh concept in mind, is now open and in full operation. The owners would like to invite all midwest divers to visit the store, meet our staff, and go diving!

Physicians U/W Medicine Seminar

The Undersea Medical Society is sponsoring an advanced underwater medicine program designated as the Diving Medical Examiner Course. The purpose of this new medical program is to train and qualify physicians to perform the comprehensive physical examination required for all categories of divers. This is an advanced course involving the medical aspects of diving and emphasis will be placed on the environment of commercial and scientific divers.

The medical symposium will consist of illustrated lecture/seminar sessions, case discussions and practicum. The new techniques of saturation diving, bell lock-out diving, thermal aspects of commercial diving and emergency medical support for remote diving operations will be emphasized. Physicians graduating from this course will be fully qualified to give physical examinations to not only commercial and scientific divers, but also sport scuba divers.

Arrangements have been made for the participants to observe commercial divers at work on the underwater cleaning process of submerged hull sections of ships while afloat in Curacao Bay, make an on-site inspection of the oil rigs in Maracaibo, Venezuela plus experience a dive in the recompression chamber in Curacao.

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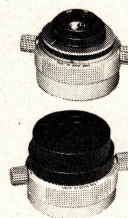
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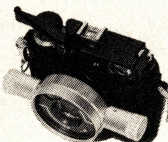
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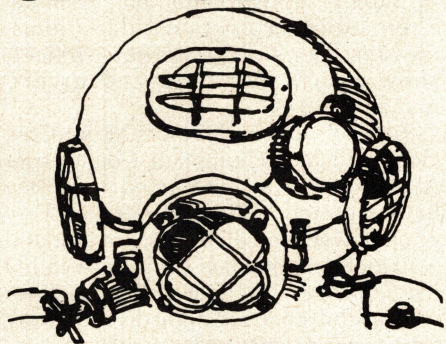
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The academic program has been approved by the American Medical Association for 25 Category I Continuing Medical Education credits. The Medical Staff will consist of Eric Kindwall, M.D., Director, Department of Hyperbaric Medicine, St. Luke's Hospital in Milwaukee; Jefferson C. Davis, M.D., Chief, Hyperbaric Medicine, USAF School of Aerospace Medicine and Vice President of the Undersea Medical Society; David Youngblood, M.D., Medical Director, Oceaneering International; and William Fife, Ph.D., Professor of Physiology at Texas A & M University.

The islands of Bonaire and Curacao in the Dutch Caribbean have been selected as the site for the first Diving Medical Examiner on November 13-21, 1976. The trip will include five days in Bonaire and three days in Curacao. To complement the medical symposium, Atlantis Safaris has arranged a full diving program in Bonaire and Curacao. For reservations, brochure and academic schedule, please write Atlantis Safaris, P.O. Box 530303, Miami Shores, Florida 33153 (phone) (305) 754-7480. Atlantis Safaris will coordinate all travel arrangements and escort the trip.

National Cave Divers Conference

The 9th Annual Technology Transfer sponsored by the National Association for Cave Diving is going to be held at the Fairmount-Colony Square Hotel in Atlanta, Georgia September 3-5, 1976.

The technical program has been designed to interest all divers; also equipment manufacturers are expected to introduce their 1977 line.

Mr. Paul Tzimoulis, Publisher of SKIN DIVER, will address the banquet Saturday evening on the subject of "Blue Holes". The U.S. Navy will have a fully manned portable recompression chamber on display in the hotel to answer questions and demonstrate the use of the chamber. The technical program consists of presentations on: oxygen toxicity and nitrogen narcosis interface, the effects of carbon dioxide, exploration techniques and equipment used in the investigation of submerged caves in the central United States, results of the exploration and mapping of the Lost Sea, state of the art — NiCad battery systems, emergency ascents as they pertain to horizontal traverses in cave diving, and air supply planning for cave diving teams.

For more information, contact Barton G. Jones, Director, 531 East 44th Street, Savannah, Georgia 31405.

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PADI ITC in San Diego

PADI International announces a unique eight day ITC at San Diego County's Camp Surf, located on the beautiful Silver Strand where the United States joins Mexico. The entire camp is reserved exclusively for the ITC to be conducted September 11-18, 1976.

A certified diving charter boat will be anchored offshore just beyond the surf line as a training and support vessel throughout the course. Both day and night training are scheduled in the Point Loma kelp beds.

Candidates must come prepared for plenty of physical activity in a rustic beach setting with lots of good food and plenty of hot showers. A 6 a.m. to 11 p.m. jam packed program is guaranteed.

For all necessary information write to PADI International or to the course director, Commander Jim Williams, 273 D St., Chula Vista, CA 92010.

Rimpac Divers Ltd.

Rimpac Divers Ltd., a full service diving company, was opened by three ex Canadian Armed Forces officers last July in Sidney, British Columbia, Canada. Their building contains classrooms, dressing rooms with showers, offices, showrooms, workshop and divers' lounge.

Rimpac's active directors Major Chic Goodman and Lieutenant Commander Al McRae have announced that they have acquired a dive boat for their very popular weekend dive trips. Their boat is a 30 foot twin engined Chris Craft called the Seascope. The boat will be used for special club charters, night dives and day trips to the Gulf Islands.

Instruction is stressed at Rimpac, a Professional Association of Diving Instructors Training Facility. In addition to basic scuba lessons Rimpac gives courses in search and recovery, marine biology, U/W photography and wreck diving.

Miami's New Chamber On Alert

South Florida now has a recompression chamber facility located at the National Oceanic and Atmospheric Administration Fisheries Building on Virginia Key in Miami.

This chamber facility can be alerted by calling the following numbers: (a diving physician will be alerted with the chamber) Dade County Fire Rescue (305) 279-1441; U.S. Coast Guard SAR (305) 350-5611; Radio HF 2182; or Radio VHF, Channel 16.

The Florida Underwater Council with the help of NOAA and Jackson Memorial Hospital Aquatic Medical Team, in addition to maintaining a ten atmosphere recompression chamber complex, is available for any information concerning

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hyperbaric treatment or evaluation of diving accidents. Training courses for treatment of diving accidents are being made available. For further information contact: Dick Rutkowski, NOAA, ERL Diving Officer, 15 Rickenbacker Cswy., Miami, Fla. 33149. >

Honest Archie from Central Skindivers

Central Skindivers, the largest retail dive operation on Long Island in New York, now offers dive trips on the *Honest Archie*, a new, 59 foot custom boat built specifically with the diver in mind.

Archie is all steel construction with a 15 foot beam and twin 12 cylinder diesel engines. This new vessel boasts a top speed of 30 knots and a fully loaded cruising speed of 20 knots plus has radar, Loran, white line recorder, scanner, and three radios. Built in conjunction with Sub Ocean Ventures, Inc., the *Honest Archie* will be docked in the Freeport area near Central Skindivers' Belmont store.

Archie will accommodate 40 passengers for short excursions. Coast Guard approved and registered, it is licensed for a 100 mile cruising distance. Accommodations are limited to 18 people on trips going over 20 miles with galley facilities and bunks for overnight excursions. An aft deck 30 feet long and a large dive platform off the stern gives divers the convenience of more space and less crowding by other divers.

Archie will be making trips to the oil rig Texas Tower, the *Andrea Doria*, 47 other wrecks, and areas abundant with lobsters — all in the immediate vicinity with its captain Alan Boehm.

Alan has 20 years experience as a diver with many credits to his name including: head of the Underwater Photographic Society in New York, ITC instructor trainer with PADI, PADI Master Instructor, professional hard hat diver, and is licensed by the state of New York to teach commercial diving.

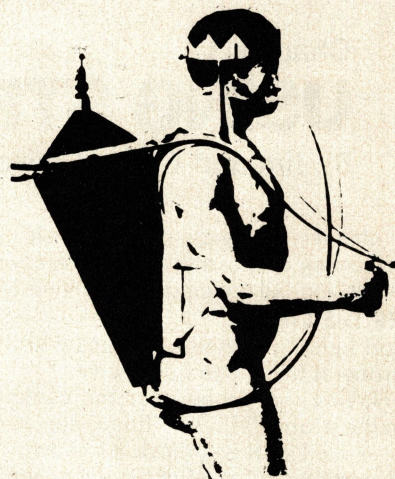
Well established in the dive world for the past 24 years, Central Skindivers has a complete dive center, housed in a 10,000 square foot facility centrally located on Long Island a few miles from Jones Beach. The dive store offers a complete repair shop with a single lock recompression chamber for equipment testing, a regulator test bench for testing new regulators before sale and repair service. They also boast three compressors on the premises.

For further information about *Honest Archie* and the dive trips, contact Central Skindivers at their main store at 2608 Marigrove Rd., Bellmore, New York 11710, (516) 826-8888, or their warehouse store located just a few minutes from Kennedy Airport at 160-09 Jamaica Ave., Jamaica 32, Long Island, New York 11432, (212) 739-5772. >

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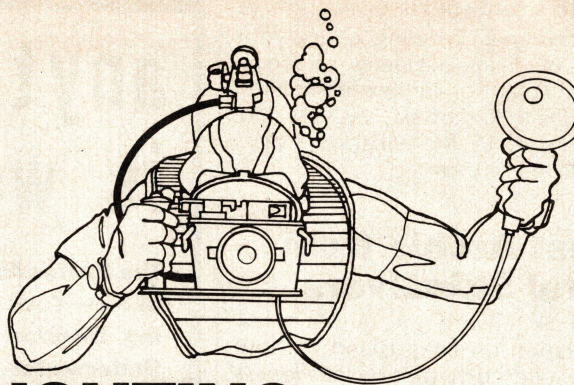
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Chapter 8

USING STROBE LIGHTING

By Jim and Cathy Church



This chapter will present three basic techniques for using strobe lighting effectively: aiming the strobe, estimating strobe exposures and balancing strobe lighting with sunlight.

AIMING THE STROBE

Good lighting technique begins with learning how to aim the strobe at the subject correctly:

1. Having the strobe near the camera causes problems. When the strobe flashes, it illuminates particles floating in the water as well as the subject. As shown below, these illuminated particles reflect light back to the light source — the strobe. And when the strobe is near the camera, the light reflecting back from the particles is directed toward the camera lens as well. These illuminated particles will appear as bright specks ("snow" or "backscatter") in your pictures. For best results, the camera and strobe should be separated.

2. The basic technique is to aim the strobe downward and inward from your upper left at angles of about 45 degrees to

the subject. By directing the strobe light in at an angle, the illuminated particles do not reflect light directly toward the camera lens. Also, by cutting the edge of the beam closely in front of the subject, you will avoid illuminating the particles between the camera and the subject.

Although we recommend starting with the basic technique described above, experiment with extreme side lighting, back-lighting and lighting from directly above the subject as you gain experience.

EXPOSURE TEST

Here is a simple test you can perform to estimate exposure settings for your strobe and favorite daylight color slide film. You can take test exposures in a swimming pool during early evening hours when sunlight won't overpower your strobe.

Be sure your subject has areas of varying brightness and reflectance — such as bare skin, wetsuit material or shells. Use a cord with knots tied at 16 inch intervals (or lead weights spaced on the pool bottom) to measure the distances accurately.

The test procedure is as follows:

1. At three apparent feet, take a series of bracketed exposures at f22, f16, f11, f8, f5.6, f4 and wide open.
2. Repeat this test at apparent distances of four and five feet.
3. When the slides are processed, project them and select the one best exposure for each distance.
4. Write these distance/f stop combinations on masking tape with a ballpoint pen and stick them to your camera or strobe. If you decide that the best exposure was probably between two stops — say between f8 and f11 — write down f8-11 because you can set the aperture control for settings between the f stops marked on the aperture scale of the lens.

If you are satisfied with these trial-and-error exposure estimates, you can skip the sections on guide numbers.

GUIDE NUMBERS

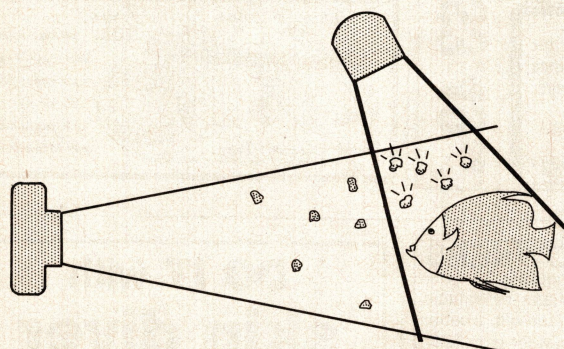
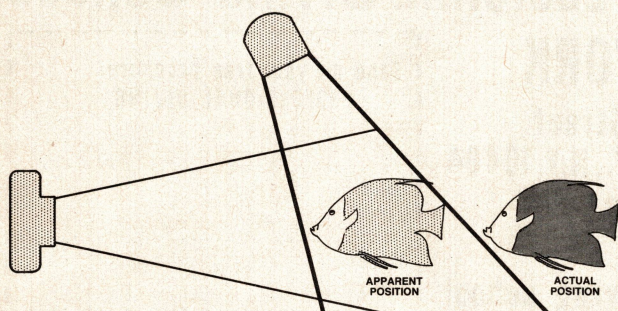
Another method of estimating exposures is to use guide numbers. A guide number, when divided by strobe-to-subject distance, gives us an estimated f stop. For example, with a guide number of 80, and a strobe-to-subject distance of ten feet, the estimated f stop would be f8 ($80/10 = 8$). Guide numbers are usually included in the owner's manual which comes with a conventional (above water) strobe.

CONVERTING GUIDE NUMBERS FOR U/W USE

Because much more light is lost when it passes through water instead of air, the above water guide number must be converted to an underwater guide number. You can do this by dividing the above water guide number by a conversion factor to reduce it to an underwater guide number for apparent distances. The conversion factors we use are as follows.

1. For bright subjects, divide by three.
2. For average subjects, divide by four.
3. For dark subjects, divide by five.

These conversion factors are based on your holding the



strobe at an angle of about 45 degrees to the subject, and that the camera and strobe are both at about the same distance from the subject.

MAKING AN EXPOSURE TABLE

Assuming an above water guide number of 120 for this example, let's make an exposure table for strobe-to-subject distances of three, four and five apparent feet:

1. Divide the above water guide number of 120 to find the underwater guide number of 30 ($120/4 = 30$).
2. Divide the underwater guide number of 30 by 3 to find an estimated fill at three feet ($30/3 = 10$).
3. Divide the underwater guide number of 30 by 4 to find an estimated f8 at four feet ($30/4 = 7.5$).
4. Divide the underwater guide number of 30 by 5 to find an estimated f5.6 at five feet ($30/5 = 6$).

Write these estimated aperture/distance combinations on masking tape and stick them to your camera or strobe.

Because guide number calculations usually yield odd numbered stops, we have included a table of full, one-third, one-half and two-thirds stops. We recommend rounding to the nearest half stop. As examples: We would round any f number between f5 and f6.3 to f5.6, and f numbers between f6.3 and f7.1 to f5.6-8, and any f numbers between f7.1 and f9 to f8.

full-stop	1/3	1/2	2/3	full-stop
2	2.24	2.3	2.5	2.8
2.8	3.2	3.4	3.5	4
4	4.5	4.7	5	5.6
5.6	6.3	6.7	7.1	8
8	9	9.5	10	11
11	12.6	13	14	16
16	18	19	20	22

How accurate will these estimated exposures be? We've found that an untested exposure table based on above water guide numbers will usually be within one stop of the desired exposure. Until you gain experience with your table, bracket your exposures. If you believe that the best exposure would be taken at f8, take three exposures — at f5.6, f8 and f11. One of these should be correct.

MANUFACTURER'S TABLES

Some manufacturers of submersible strobes provide exposure tables for their strobes. These tables usually assume that the subject is against a wall or flat on bottom, and that you are using a fresh battery. Whenever we are photographing subjects which are away from any reflecting surfaces, and our battery is only moderately fresh, we usually open the lens one stop wider (next lower numbered stop) than these tables show.

EFFECTS OF SUNLIGHT

The brightness of sunlight can also affect your exposure settings. Whenever an exposure meter reading off the subject indicates a higher numbered f stop than indicated by your exposure table, sunlight has overpowered your strobe and will

determine the exposure. This often happens at apparent strobe-to-subject distances of about three or more feet in clear, tropical water.

The rule of thumb is: read the f stop on your exposure meter, read the f stop on your exposure table, and choose the higher numbered f stop of the two.

BALANCING STROBE WITH SUNLIGHT

You can sometimes control the balance between strobe and sunlight exposure to darken or lighten a background. For example, suppose you are photographing a school of fish against a coral reef. The exposure meter indicates that f5.6 is the proper exposure. You can photograph the fish two ways:

1. Set the aperture for f5.6 and hold the strobe back to the f4-5.6 strobe-to-subject distance. The resulting picture will be a sunlight exposure with strobe fill accentuating the fish in the foreground.



2. To accentuate the fish even more, set the aperture for f11 and hold the strobe in close for the f11 strobe-to-subject distance. The fish will be properly exposed, but the background will be under-exposed by two stops. The bright fish will be accented by the darker background.



CONCLUSION

This article has presented the basics for using strobe lighting at distances of about three apparent feet or more. Subsequent articles about using close-up lenses and extension tubes will discuss strobe lighting techniques for these more specialized forms of underwater photography.

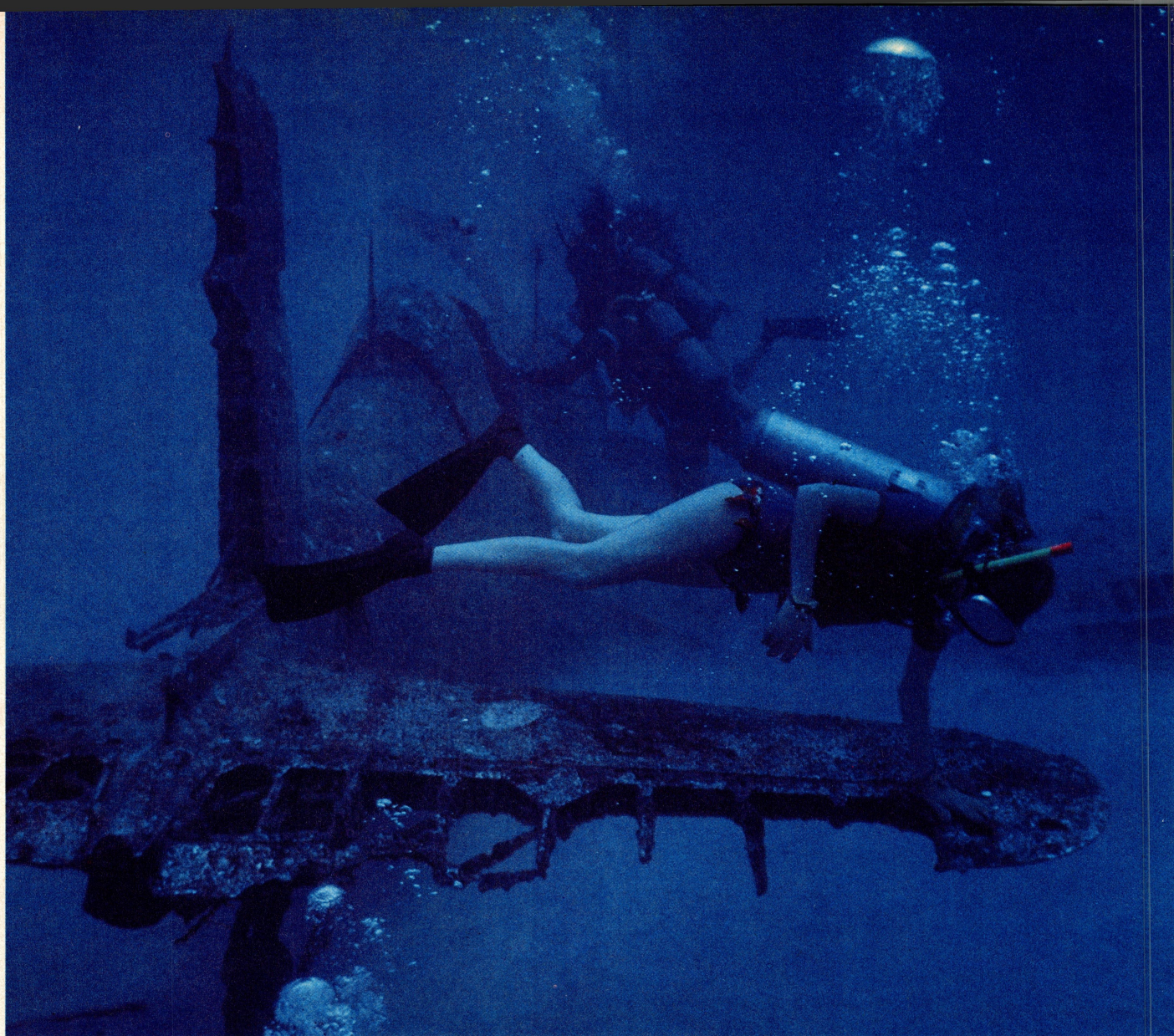
PHOTO QUIZ

1. Given an above water guide number of 90, what would the estimated exposures be for apparent distances of three, four and five feet with average subjects (nearest half stop)?
2. About how accurate will these estimates be?

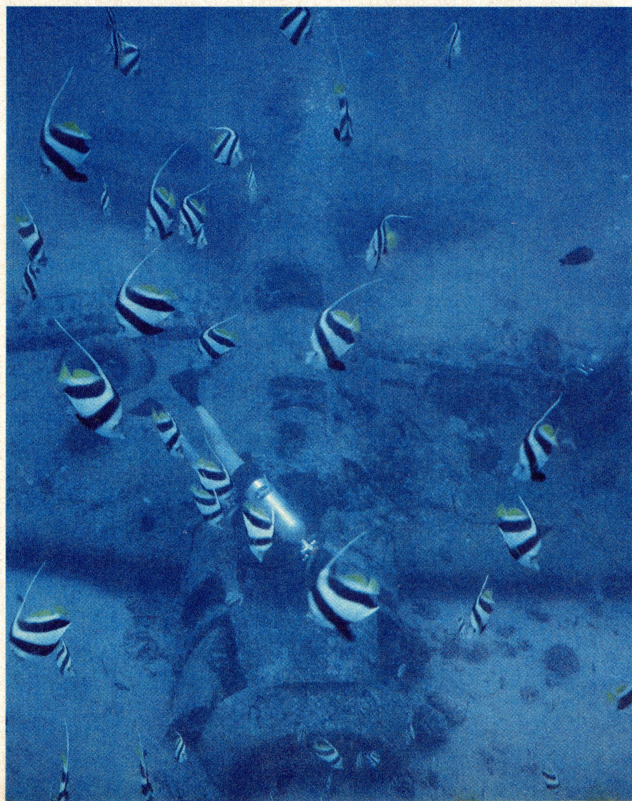
NOTE: Neither Jim and Cathy Church nor SDM can critique your work. Answers to the above: (1) f8, f5.6 and f4; (2) within one stop of the desired exposure.

ASSIGNMENT

1. In a pool or open water, perform an exposure test as described in this article.
2. If a guide number is available for your strobe, calculate the estimated exposures for distances of three, four and five feet.
3. With a stationary subject in a pool or open water, try taking pictures with natural and darkened backgrounds.



photography by Author



As divers explored a World War II Corsair fighter plane, they realized what a test of skill it was for the pilot to try and make a perfect landing on the water of a battle torn sea. Resting in 90 feet of water off Nanakuli, Oahu, the old fighter plane was estimated to have gone down around 1943. The bent blades of the propeller indicated that it was still windmilling at the time of impact. Other than the deterioration of the surfaces, it was in excellent condition.

Staggering to the imagination is the fish life. Each plane is virtually an underwater zoo of brilliantly colored tropical water life. A school of heniochus (false moorish idol) seem to peer curiously at the diver inspecting the plane's underside. These planes have been transformed into artificial reefs by nature over the past 33 years. The native fisherman know the locations of what they suspect are wreck sites because of the amount of fish their traps and nets yield in these spots.

OAHU'S SUNKEN SQUADRON

OF WWII AIRCRAFT

By Bob Zehring

Devastating as it was, the raid of Pearl Harbor on the Hawaiian island of Oahu on December 7, 1941, left surprisingly few wrecks in the offshore waters. The U.S. ships struck during the attack were all anchored in Pearl Harbor itself. Not one of the Japanese ships were hit, since they remained at least 200 miles offshore. The U.S. had some 450 planes on the ground at various airfields of Oahu, but only 38 of these were able to become airborne during the attack. Ten were shot down. The Japanese lost 29 planes. Presently, there is little hope of locating the remnants of these planes that crashed and shattered upon impact with the ocean's surface.

Although there is plane wreckage scattered around the entire island of Oahu, most finds are off the west coast of the island. This area was widely used during those years for gunnery and bombing training. The pilots practiced their dive bombing in Makua Valley. They made strafing runs on floating targets in the coastal waters and sharpened their air-to-air shooting techniques by firing at wind sleeves towed by another plane. The tow cable took its toll of planes when pilots made an improper roll through on a firing pass and struck the wire. When the cable became entangled in the prop, that was all she wrote.

Then there was the usual share of engine failures or other mechanical problems which meant aborting the flight. In those days, planes didn't have ejection seats, so pilots in a troubled bird would often elect to ride her in for a controlled landing on the water rather than bail out.

The planes that were brought in by controlled ditching usually remained intact and sank to the bottom within a few minutes after the pilots got out. The planes that hit the water out of control and with great impact just broke apart.

Divers regularly spot pieces of planes — landing gear, props, engines, parts of wings, tails, etc. — especially between the famous surfing beach of Makaha on toward Kaena Point. Only scattered remnants remain. Years of changing ocean currents have spread pieces over wide expanses of the bottom.

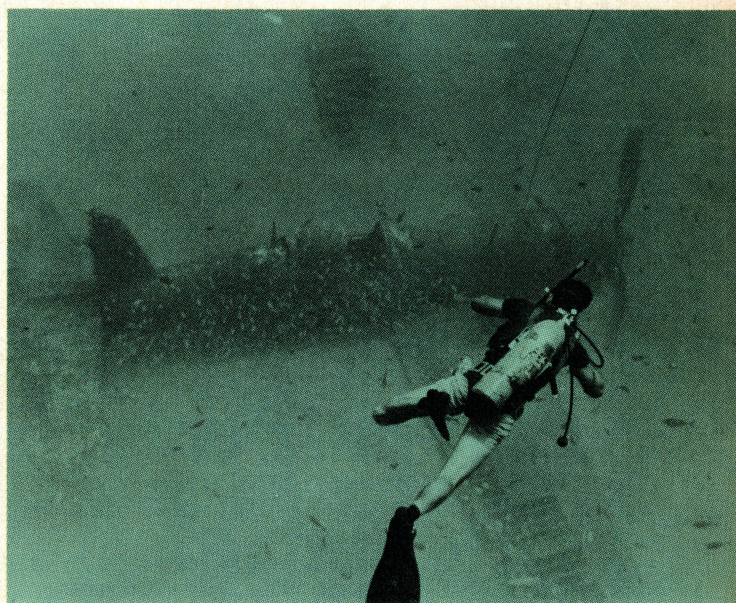
The planes still intact, or nearly so, are naturally most attractive for divers. There is a feeling of excitement and awe as the air machine takes form in the blue depths to the diver descending the fallen bird. Equally staggering to the imagination is the fish life (literally thousands) making habitats of the planes.

No marked marine charts show the wreckage sites. Nor are there records available any longer at the Hawaii military bases indicating the where's, when's, or why's of the losses. Old-timers who lived along the coast have only vague recollec-

tions of the incidents but no details. A few old fishing families know locations of what they suspect are wreck sites because of the amount of fish their traps and nets yield in these spots. They naturally are reluctant to share their knowledge of these locations. The fishermen are especially concerned about scuba divers learning of the wreck sites, since they know from harsh experience that some inconsiderate divers will tear anything apart for souvenirs — and, in the process, disturb their traps.

Wreck diving by some of the Hawaiian clubs began as a spirited effort only a few years ago. Before then, few individuals knew of wreck sites. Some of the native residents who were introduced to scuba for the first time in the 50's and 60's, have dived on some of the wrecks for a number of years. They, too, are reluctant to share their information for fear of the inconsider-

While descending on the silent graveyard of World War II planes, once a testament of destruction, diver Dave Lambert is awestruck. This plane, at one time an instrument of death is now a picture of serenity and abundance of life. Bonding it to its final resting spot, ocean's shifting sand settles on the Corsair's wing.



photography by Author

erate divers who could care less about the unique environment surrounding the wrecks — the thousands of fish, the historical significance of the relic, and the pure thrill of diving on the unnatural intruder on the ocean scene.

The Pearl Harbor sport divers were one of the first organized groups to make wreck dives a club affair. The Sea Lancers from Hickam AFB were quick to follow suit. The Pearl Divers had located an old Hellcat that best estimates indicate went down around 1943. The aircraft is about one half to three quarters of a mile offshore, upside down in 65 feet of water. Except for the prop, which was probably torn off on impact, the plane is otherwise intact.

While searching for the Hellcat a small group of Sea Lancers stumbled onto an old gull winged Corsair. This plane is in 90 feet of water, about one mile offshore and in even better condition than the Hellcat. The Corsair rests upright on the bottom. Its canopy is neatly back in a full open position, and, except for its prop bent at the outer tips, one could imagine the aircraft sitting on the deck of a carrier — rather than the ocean bottom. It is believed the plane went down in '43 or '44.

The fabric covered control surfaces of the wings and tails of both the aircraft have since deteriorated. But the rest of the body of the planes are in excellent condition. The tires are still on the Hellcat. The Corsair's instrument panel, stick, and seat appear capable of being put back into operation with just a little cleaning of the algae and crustaceans that have built up over the years.

Both planes rest on sandy bottoms well away from coral reefs, rocks, and ledges. The communities of school fish that have adopted the metal air birds as a welcome addition to their environment are as interesting as the aircraft. Each plane is virtually an underwater zoo of colored tropical water life.

If divers are careful in their approach to the planes, they will not spook the fish. It is a sensation unequalled to explore these sunken relics of a war long past while sharing the water with countless finny creatures almost as dense as the sea itself. In fact, there are times when the fish are so thick it is difficult to distinguish the plane's fuselage from a position as close as a wing's length away.

A more recent addition to the underwater gallery of the grand flying machines is an old T-6 trainer modified to look like a Japanese attack plane for the filming of *Tora, Tora, Tora*, the epic of the Dec. 7, 1941, attack on Oahu. The aircraft had an engine failure during one of the filming sequences in 1969. The flyer, a veteran of World War II and later a pilot for an interisland airlines, bellied his craft onto the water off Barber's Point, calmly stepped out onto the wing and floated away as the plane sank from under him to join the sea life 45 feet below. He was promptly picked up by standby rescue crews.

There were several unsuccessful attempts to locate the plane after the crash. In the spring of 1972, a small group of Sea Lancers on a chartered boat — acting on tips from Master Diver E.R. Cross who has a maintenance contract for the underwater pipeline in the area — found the aircraft. The photos revealed that the modification of the plane, primarily to the engine section and the aft fuselage, was not as substantial as the pilots had believed. It was these sections that had come apart on impact and lay beside the original part of the T-6's frame and fuselage which remained intact.

The divers in Hawaii enjoy wreck diving as a change of pace and there is always the challenge to locate other relics. One thing for sure, the sincere and dedicated of the groups look and enjoy without souveniring of parts still attached to the body of the find. Most of the divers are dedicated to preserving the relics for others to enjoy in the years ahead. It wouldn't take long, for example, to denude a plane of its prop, instruments, landing gear, wings, tail, and guns.

The wrecks are monuments of history lying in the sea's safe deposit box as memorabilia of times past ever a part of the heritage of the islands.



photograph by Author





photograph by Dave Lambert

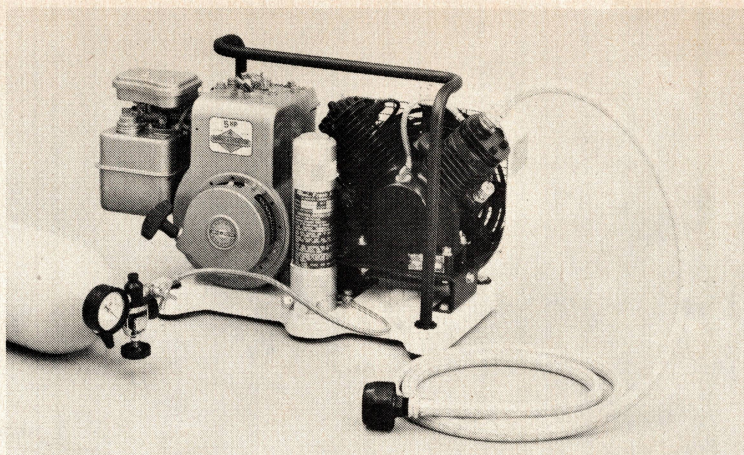
To sharpen their air-to-air shooting technique, the pilots fired at wind sleeves towed by another plane. A close inspection of the Corsair shows a tear in the right wing and a cable wrapped around the hub of the propeller. This indicates that the pilot probably hit one of the tow wires and this caused engine failure. During this period of time, planes did not have ejection seats, so the pilots would often elect to ride it in for a controlled landing on the ocean's surface rather than try a dangerous bail out.

This Hellcat rests in 90 feet of water. At one time it was a notorious fighter plane that was usually based on an aircraft carrier. It has now become the habitat for many different fish. A close up view of the tail section shows how the plane can support and contribute to the complicated balances of life in the sea. Delicate sea plants and coral heads abundantly grow on the wing. The population of fish is so dense at times, it becomes difficult to distinguish the plane from the silent, majestic underwater world.



American Bristol's Fresh Air 4 SDM TEST REPORT

By Nancy Ackerman



American Bristol Industries has developed a new compact portable air compressor, the Fresh Air 4. This efficient, lightweight unit, as shown, weighs in at 75 pounds and is capable of filling a standard 72 air cylinder to 2250 psi in approximately 30 minutes.

The Fresh Air 4 system is comprised of a Bristol Duplex, two cylinder, three stage compressor assembly, Fresh Air purification system, and a power source.

The compressor unit itself operates in three separate compression stages. There are relief valves situated on each stage of the compressor, as well as one integrated into the purification chamber. American Bristol has also added an extra fail safe device, called a burst disk, to let the air out of the bottom of the purification chamber. The standard burst disk for the Fresh Air 4 is set at 3200 psi (optional disks are available for higher ratings of 4100 and 5200 psi).

The compressor is rated for a maximum continuous duty of 4000 psi and intermittent use of 4500 psi. It offers a displacement of 4 cfm (cubic feet per minute - a measurement signifying the volume displaced by the full stroke of the first stage piston, multiplied times the rated rpm of the compressor). The rpm of the Fresh Air 4 compressor is 2000 to 2400, depending on the motor used. Air delivery or output, of this compressor is 2.5 cfm. This rating of air output is measured at a specific controlled pressure and temperature (standard conditions are considered to be: 54% relative humidity and 70° F.) The cooling of this system is via air cooling.

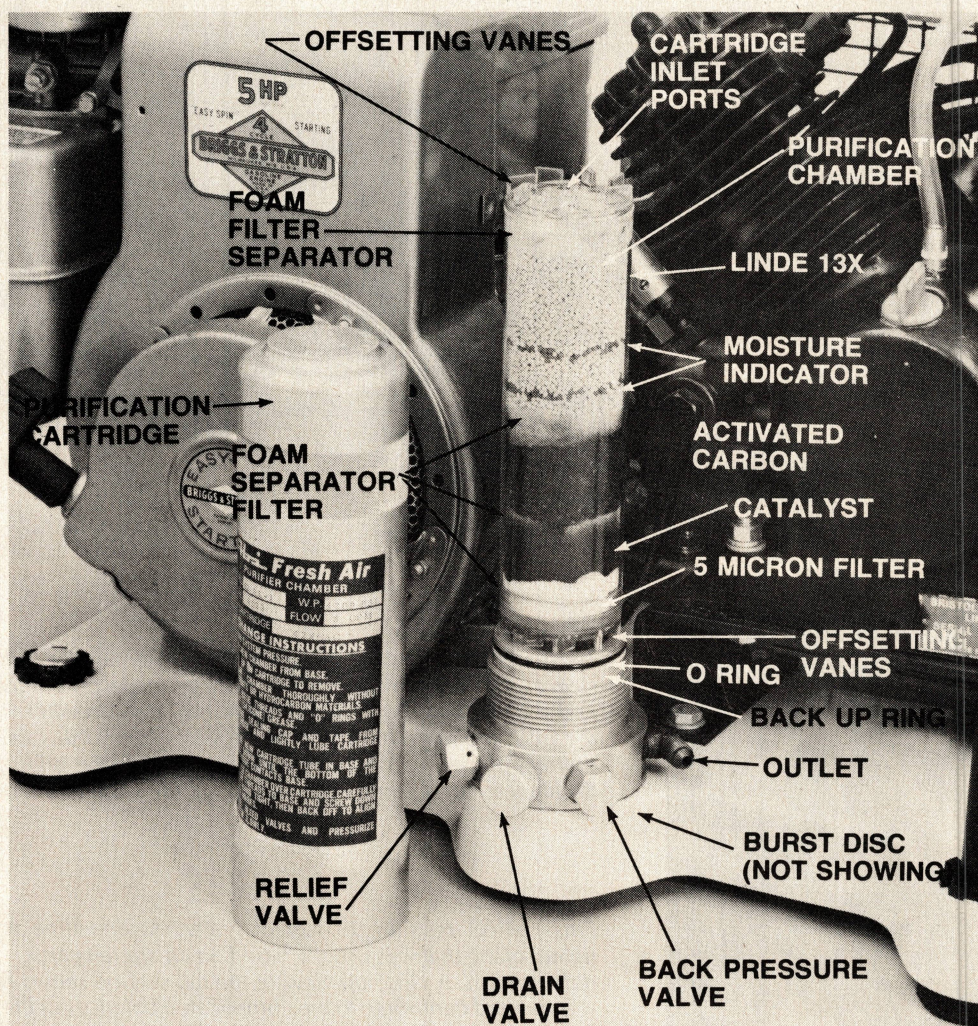
The purification system (filter and water/oil separator) of the Fresh Air 4 is the most significant and unique aspect of the entire compressor assembly. It boasts several important design features which allow the system to claim dependability, safety, efficiency and easy maintenance.

High pressure air from the compressor first enters the purification system through a mechanical separator. Air then goes through eight filtration and purification layers in the disposable cartridge.

The Fresh Air 4 is an efficient, lightweight portable unit (75 pounds) and is capable of filling a standard 72 air cylinder to 2250 psi in approximately 30 minutes.

ports, it is offset and consequently expanded, cooled and centrifuged. The oil and water vapor present in the air at this point is condensed on the chamber wall, coalesces and drains into the moisture sump. Any remaining contaminants are

collected in the next phase of the purification system. Air is then passed through eight filtration and purification layers — each of which serves a specific purpose in the process of Fresh Air 4's purification. This



High pressure air first enters the purification system through a mechanical separator. Air then goes through eight filtration and purification layers in the disposable cartridge. The Fresh Air 4 is an efficient, lightweight portable unit (75 pounds) and is capable of filling a standard 72 air cylinder to 2250 psi in approximately 30 minutes.

part of the purification system, found within the singular purification chamber of the compressor, is a disposable type cartridge that can be replaced when it has become saturated with impurities. Replacement is a simple operation, executed without tools. The anodized, aluminum purification chamber merely screws off and the chemical cartridge lifts out. Cartridge life in a situation of average humidity, American Bristol claims, is approximately 25 hours.

Within the cartridge itself, air is first passed through an adsorbant chemical bed of Linde 13X to further remove any remaining oil aerosol and water vapor. It then goes through a layer of activated carbon designed to remove gaseous hydro-carbons, carbon dioxide and odors. The final filtrations in the cartridge is through a catalyst which eliminates the carbon monoxide. There is also a 5 Micron filter for removal of particulate impurities. These layers are interspersed with foam separator filters to further the purification process. All the chemical layers are contained in the one disposable cartridge, making an exchange of purification chemicals simple and quick. A band of colored particles inside the clear cartridge changes from blue to pink to signify when the replacement should be made.

The corrosion resistant aluminum purification chamber has an integral safety burst disk, moisture drain, relief and back pressure valves. The chamber itself is an impact extruded aluminum alloy manufactured in accordance with the ASME Code for Unfired Pressure Vessels. It has a four to one safety factor (the standard scuba tank must withstand 5/3rds of the rated working pressure indicated on the cylinder — a cylinder rated at 2250 psi has a test pressure of 3750 psi) and has a minimum tensile strength of 47,000 psi.

The power source for American Bristol's Fresh Air 4 may be one of two gasoline engines or an electric motor. Weight and dimensions vary with the particular option chosen. Other specifications for each individual motor is also shown in the accompanying chart.

The compressor brought to SKIN DIVER, as shown in these photographs, had the standard gasoline, 4 cycle power source. Specifications for this engine are, again, as shown on the chart. The compressor unit with this particular motor filled a standard 72 tank for SKIN DIVER in just less than 30 minutes. The weight of 75 pounds, with the sturdy carrying handle built onto the compressor's base, isn't too much for one person to transport a reasonable distance. And, when even longer distances are involved, the design of the handle allows two people to comfortably carry compressor together.

The compressor, as shown here, is the basic complete unit sold — and is \$1850 F.O.B. American Bristol Industries' plant in Harbor City, California. But there are any number of features available to further enhance this compact little compressor's convenience and efficiency. These features include: magnetic starter, automatic stop, combination/automatic stop and start, electronic dew point alarm, electronic carbon monoxide alarm, temperature gauge and high temperature shut down, mechanical/chemical change indicator, panel with inner and final stage pressure gauges for the three compression stages, hour meter, and low oil level float switch. Many of these options are available only on the electric models and costs for these features begin at \$51 (for the hour meter).

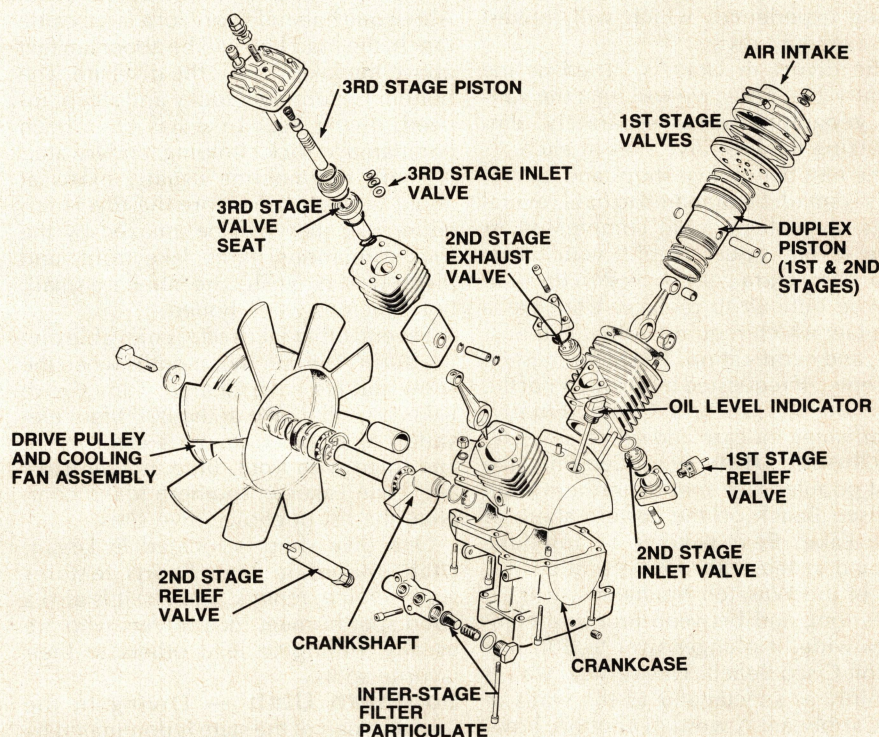
This handy compressor can remain as simple as the one shown in our photographs here, or can be complemented with any number of the aforementioned features and become a rather deluxe unit.

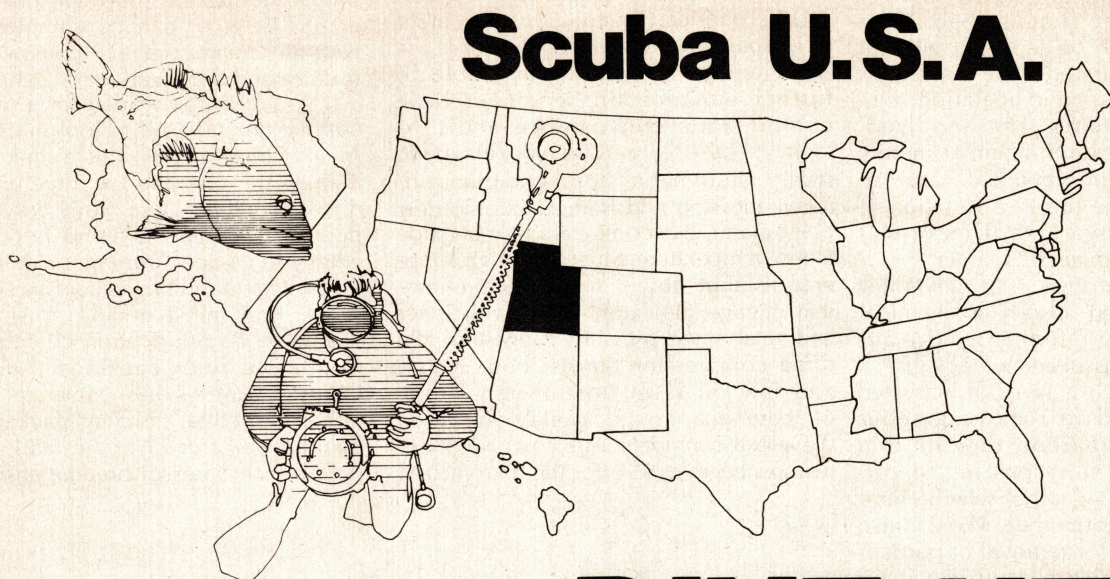
If you're in the market for a portable compressor, take a long look at the Fresh Air 4. Considering it fills a tank in less than 30 minutes and the three units' individual weights run from only 65-87 pounds, this little dynamo is probably what you've been hoping for. And don't forget its portability and compact dimensions. And, most of all, consider the Fresh Air 4's purification chamber and disposable filter cartridge. American Bristol Industries has come up with a rather attractive, efficient package that could allow a diver in the market for a portable compressor breathe easier.

power sources

	type engine	horsepower	dimensions	total weight
gasoline (std)	Briggs & Stratton 4 cycle	5	26" long x 14' wide x 17" high	75 lbs.
gasoline (SL)	2 cycle	6	same	65 lbs.
electric	Baldor single & 3 phase	2	21" long x 14" wide x 17" high	87 lbs.

The diagram below is an exploded view of the Fresh Air 4's compressor unit. It operates in three separate stages and has relief valves situated on each stage. The compressor is rated for continuous pressure of 4000 psi and delivers 2.5 cfm of air.





By Neal Langerman, Ph.D.,
and Pat MacIlvaine

DIVE UTAH

Think of Utah and you usually think of skiing, fishing, or camping. Most Scuba divers would never think to "Dive Utah." However, to paraphrase the U.S. Forest Service, "Utah is indeed a land of many uses." One of these uses is most certainly diving. From beautiful Bear Lake to the north, to Lake Powell filling the Glen Canyon National Recreation area in the south, Utah offers a variety of diving experiences which will interest and excite all divers.

The diving in Utah is varied as the countryside. Thus, we will treat the various geographic areas separately, emphasizing the best dive sites at each.

The number of dive shops and air stations is small. Be prepared to haul several tanks, a small portable compressor, or drive several hours to refill your tanks. Also, carry extra gear. A broken fin strap may be difficult to replace. Utah has a dive law which requires a float and flag, vest, and certification. The latter must be presented if requested by an officer of the Division of Fish and Game. Finally, spearfishing for carp and sucker is legal.

Northeast Utah — Certainly the most popular dive spot in northern Utah is Cisco Beach on the eastern shore of Bear Lake. Bear Lake is a fault lake situated at the 6000 foot elevation just east of the Wasatch Mountains. It is 20 miles long and between four and eight miles wide. It plunges over to 200 feet just off Cisco Beach. This vertical wall is certainly as spectacular as the walls of the Caribbean. A word of caution, however. At the elevation of Bear Lake, the

diver must pay strict attention to the High Altitude No Decompression Limits. The nearest chamber is in Salt Lake City.

June through September is the best time to visit Bear Lake. The water is frequently very clear with visibility easily in excess of 30 feet and water warm enough not to require hoods or mitts. To reach Cisco Beach, go north from Laketown about ten miles on a dirt access road. About one half mile north of a large cattle ranch, the road bed will be about ten feet above the lake. This is the dive site. The bottom is extremely rocky and steep. Indeed, diving Bear Lake has often been compared to rock climbing, underwater. A sharp thermocline usually exists at about 60 feet, but before the divers encounter it, they will be amazed by the rock formations, large lake trout, and plethora of crayfish. The latter are small, but delicious when boiled.

Several other lakes offer enjoyable diving during the summer months when the snow and ice have cleared. Tony Grove Lake, a glacial lake at the 8000 foot elevation to Logan Canyon is clear, cold, and filled with trout. Bloomington Lake and Twin Lakes in southern Idaho complete the list of choice dive sites.

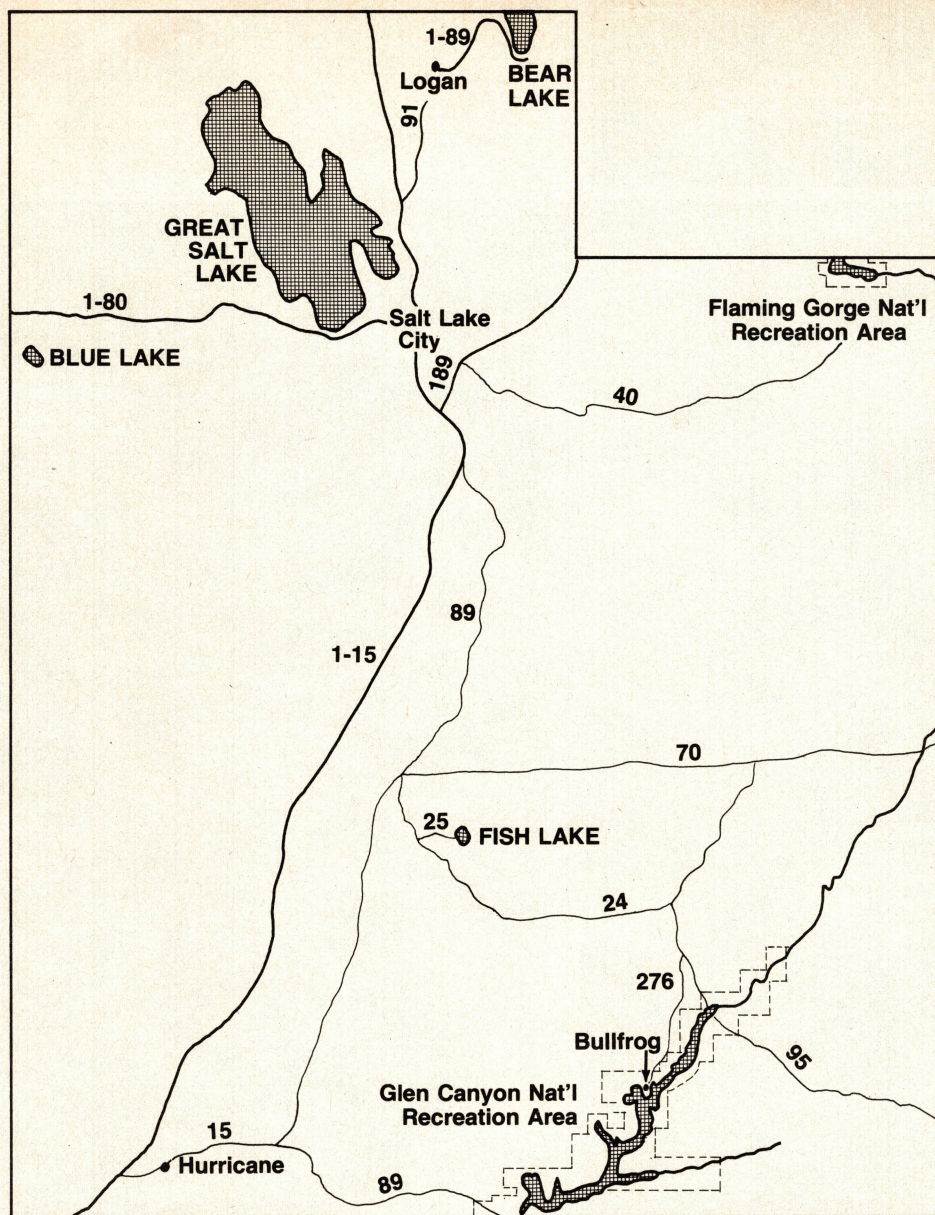
One dive shop is located in Logan, Utah. Mountain Man Sports features gear, service, rentals, and air. It is also a good spot to meet local divers who are usually willing to lead others to their favorite spots.

Southern Utah — Diving in the southern part of the state is dominated by Lake Powell. While a power boat is ex-

tremely useful, it is not essential. Just north of Bullfrog Marina is a camp site from which very good shore diving is



photograph by Neal Langerman



90 miles north of Salt Lake City is the town of Logan where Mountain Man Sports fills tanks and rents dive gear. Further north 40 miles is Bear Lake, 6000 foot elevation near the Wasatch Mountains. To the west about 125 miles is Wendover, known for its casinos and Blue Lake, famous for the bubbling hot springs. Headed east from Salt Lake City on highway 40 about 209 miles you'll find Flaming Gorge. Fish Lake is approximately 183 miles south of Salt Lake City offering good camping and dive spots. 156 miles southeast of Fish Lake is Bullfrog with its marina and camp grounds. In the southern most part of Utah is Hurricane, 10 miles east of I-15. S & S Divers Supply fills tanks and rents dive gear. About 146 miles east of Hurricane is the Glen Canyon National Recreation Area.

possible. The bottom is varied with depths well in excess of any the sport diver would care to explore. Fish are plentiful. Usually two dives and a snorkel swim in one day are enough to convince the most cynical of divers of the beauty of diving Lake Powell. Further south in the Glen Canyon National Recreation Area is Glen Canyon Dam at Page, Arizona, just across the Utah line. For divers with a boat, the Glen Canyon area offers a multitude of inlets and coves. It is strongly suggested that you check with the Forest Service for advice and to tell them your plans. They are extremely cooperative and helpful.

The nearest air station is S & S Divers Supply in Hurricane, Utah. As can be seen from the map, this is a fair drive from Powell, so be prepared.

Central Utah — East of Salt Lake City lie the famous ski resorts and beyond, the

Flaming Gorge dam backs up the Green River 91 miles. Again a power boat is almost essential, since it gives the divers access to the myriad of coves and bays in the gorge. Visibility in Flaming Gorge is spotty, but when clear, offers beautiful underwater scenes. The water is always cold: a full $\frac{1}{4}$ " wet suit is required. However, when the air temperature is in the 90's, a cold dive is really fun.

The nearest dive shop is in Salt Lake City. USAFECO Diving School offers a complete line of gear, service, rentals, and air. West of Salt Lake City is the Great Salt Lake. This is definitely not a place to dive, but it is fun to float on top of the briny water.

Blue Lake, located on the salt flats about 20 miles south of Wendover, Nevada is an interesting geothermal lake. This is an extremely difficult site to reach: a four wheel drive vehicle is es-

sential and you can expect to carry gear up to one half mile. However, the clear, 75° water and the bubbling hot springs make the effort worthwhile, especially in the winter when the air temperature is frequently below 20°. For the divers distraction, Wendover casinos are nearby.

Fish Lake is located in central Utah and should be included on the itinerary of a trip to the state. The clear, cold water is full of fish and plants. It is relatively easy to reach and is a beautiful site for diving and camping.

Winter diving in Utah is strictly for the very hardy. It is cold. Conditions are harsh and unpredictable.

Utah is indeed a "land of many uses." Bring your camping gear. You can camp on the lake shore at most sites. For the avid diver, a trip to the Beehive State offers an opportunity to dive in some of the most beautiful country in the U.S. ➤



THE LITTLE RED LOBSTER

Rare photos of unusual Caribbean Crustacean

By Bruce Bowker



photography by Author

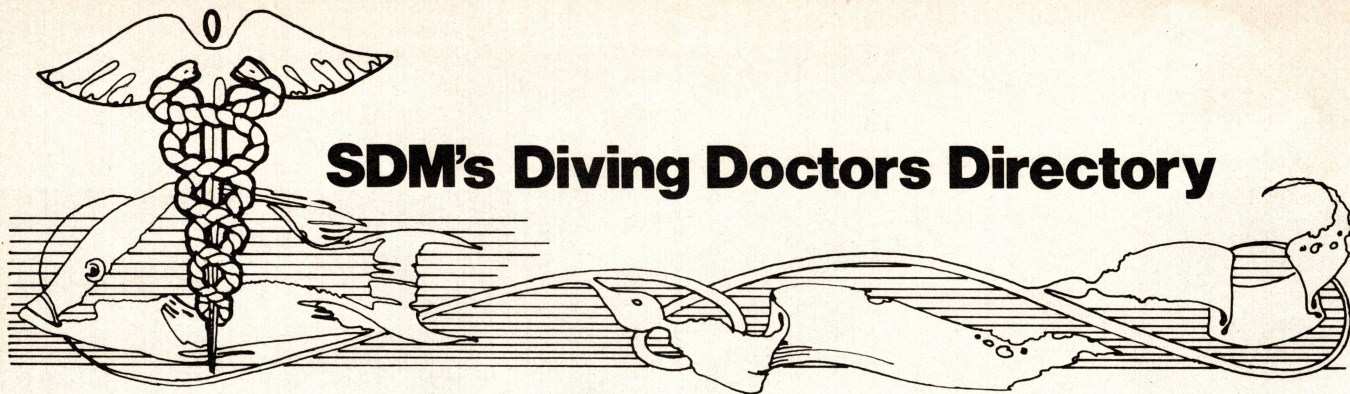
Because of his size and habitat, few divers are aware of the existence of the little red lobster, *Enoplonetopus antillensis* Lütken. Until very recently, this miniature bug, seven inches in length, was considered a member of the Nephropidae family. With more studies, it is thought to be among the Axiidae or mud lobster family.

There are four species of *Enoplonetopus*, all of which occur in the Indo Pacific region. *Enoplonetopus antillensis* has a pantropical distribution and is the only one of the four species that is known to occur outside of the Indo Pacific area. All of these species have generally been considered to be rare.

Having spent approximately a total of six hours observing these little lobsters I noticed they are fond of shallow waters (30 feet or less), but are occasionally found at deeper depths. We found most of them in small crevices to protect themselves from species higher up on the food chain.

They have been seen during the daylight hours, but tend to be nocturnal. We spotted ten at one time, two of which were in a large pail, but were not to be found the next day. At least two can usually be found together in one den.

When a powerful light was put on them, they became very animate, making it very difficult to photograph. They were very receptive to the crushed urchin we squirted at them and attacked aggressively. ➤



SDM's Diving Doctors Directory

By Ronald P. Bangasser, M.D.

Knowing how to get help fast in an emergency is an important part of any rescue, diving or otherwise. Periodically, SDM has listed physicians in the U.S. who are involved in diving and dive medicine. The list presented here is an up-to-date complete list of diving physicians. It is current as of March, 1976.

Each physician in this article has been contacted by letter and their current addresses and phone numbers have been listed. Some of the physicians have listed specialty areas of dive medicine such as marine poisons or hyperbaric medicine.

Hopefully you will never need to use this list in an emergency, but pertinent names and phone numbers should be with you on every dive. And, if you ever have any medical questions related to diving, everyone listed here will be glad to listen.

Diving is meant to be fun — but even with all the stress on safety in diving today, an accident still can occur. This list will help you be prepared to handle that accident.

BAHAMAS

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Freeport, Grand Bahama Island
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District Medical Officer
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Freeport, Grand Bahama Island
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Department of Anesthesia
Stanford University Medical Center

Chico

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(916) 343-4228

Colton

Bruce W. Halstead, M.D.
World Life Research Institute
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marine venoms

Corona

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C3720 Old Magnolia Ave. (91720)
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El Cajon

Gaylord B. Parkinson, M.D.
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(714) 444-1101

Fresno

Marvin C. Beil, M.D.
1616 West Shaw, Suite A-5 (93705)
(209) 224-3116

Glendale

Michael D. Rosco, M.D.
Roberts Medical Group
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(213) 225-3131
marine venoms

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(213) 670-1777
ear, nose, throat

Thomas C. Noguchi, M.D.
Chief Medical Examiner-Coroner
County of Los Angeles
1104 North Mission Rd. (90033)
(213) 223-3231
drowning; scuba diving accidents

Findlay E. Russell, M.D.
Director, Laboratory of Neurological Research
Los Angeles County Univ. of So. Calif. Medical Center
Box 323, 1200 N. State St. (90033)
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marine venoms

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Medical Diving Officer
City Marine Rescue Patrol
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3475 Kenyon St. (92110)
(714) 222-0411

Stephen P. Murphy, M.D.
Anesthesia Service Medical Group, Inc.
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drowning

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Heston L. Wilson, M.D.
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(714) 239-3043

Frank B. Wisner, M.D.
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decompression sickness, diving accidents

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Queen of the Valley Hospital
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F. Limongelli, M.D.
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hyperbaric medicine

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industrial diving physician

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Freelance Communications
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diving dermatology

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University of Florida (32601)
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post-immersion syndrome; drowning and near drowning

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forensic pathology; circumstances of deaths due to drowning

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H. Logan Holtgrewe, M.D.
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Mebane

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Mebane Medical Arts Bldg.
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Carteret Medical Center
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marine poisoning

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OHIO

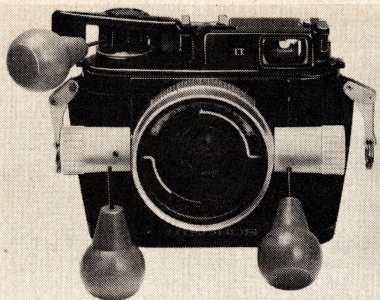
Toledo

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Chairman, Department of Anesthesiology
5315 Fairgreen (43613) (home)
Parkview Hospital (office)
(419) 475-9107 (Home) — 242-8471 (Office)

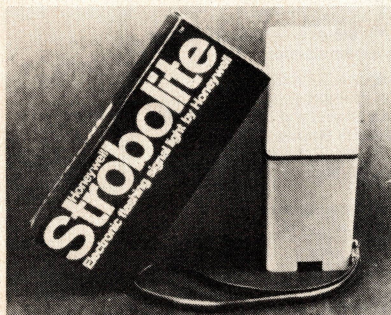
Gilbert B. Stansell, M.D.
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(419) 385-4661 — 536-2282 (home)

Donald Woodson, M.D.
Medical College of Ohio (43614)
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hyperbaric medicine

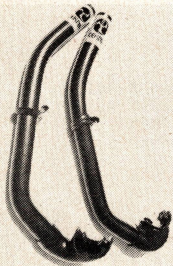
(Continued on Page 56)



Glenn Beall's Floating Allen Wrench. Wrenches for No. 6-32 set screws are small and easy to lose. They are difficult to replace while traveling. The oversized, bright orange handle acts as a float. If dropped into the water, it pops to the surface immediately and is easily spotted. These wrenches are priced at \$2.80, plus 50 cents for shipping and handling. Available from Glenn Beall Industries, 887 South Route 21, Gurnee, Ill. 60031.

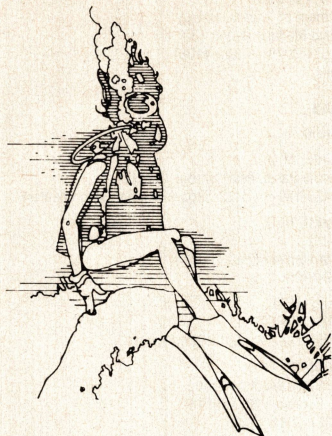


Stroblite by Honeywell is 300 times brighter than an ordinary flashlight yet weighs only 11 ounces. This hand held electronic flashing signal light lasts up to 7 hours on two C size alkaline batteries. It is waterproof, floats and is a compact 6" x 2½" x 1½". Stroblite is visible for miles in all directions and is a perfect emergency light for skin divers, boaters. \$19.95. Effron Sales, Box 8744, Fountain Valley, California, 92708.



Tekna's new Tube-Tab snorkels feature radical new mouthpiece design having hollow, oval shaped taps that collapse and instantly conform to each individual's bit and shape. Available in regular and small mouthpiece sizes. Both swivel, which allow the diver to offset the mouthpiece to suit the position that is best for him or her. This comfortable new snorkel is priced at \$5.50 from Tekna, 3549 Haven Avenue, Menlo Park, Calif. 94025

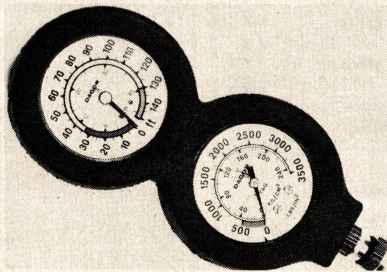
New Gear



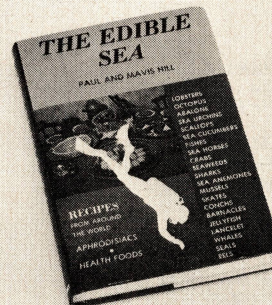
A specially designed stainless steel spring wire from D. Avers and Assoc. holds prescription glasses in most round and oval masks. After removing the temple pieces, the wire is fitted to hold most all prescription glasses. Loops in the wire lock over the hinge sections for a secure grip. The spring in the wire allows a certain give so glasses set on the bridge of the nose for comfort. \$2. D. Avers and Associates, P.O. Box 11429, Chicago, Ill. 60611.



Dacor introduces a new instrument console that combines Dacor's TAG underwater pressure gauge with any one of four Dacor depth gauges. This console is designed to conform to a diver's hand and has a super heavy duty shock absorbing rubber casing. Both gauges have metric equivalents on the face. Model #ICL 150 shown is priced at \$79. Now available from the Dacor Corporation, 161 Northfield Road, Northfield Illinois, 60093.



Aqua-Craft has improved and "beefed up" the handles of two of their Bandito spearguns, the Shark and the Manta. For greater strength and durability, these new handles are constructed of high strength ABS plastic with a 20% fiber fill. The handle for the Manta G-16 gun is \$54 and the handle for the Shark G-18 gun sells for \$59.95. They both are now available through Aqua-Craft, Incorporated, 3280 Kurtz Street, San Diego, California 92110.

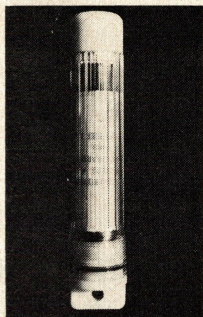


The Edible Sea is the first book that covers everything in the sea from the standpoint of what is edible, what is toxic, where it is found, how to prepare it for the table, step by step. Authors Paul and Mavis Hill are avid divers and seafood enthusiasts. They have researched seafood for 18 years, from abalone to aphrodisiac seafoods. For \$15, an autographed copy may be obtained from Educational Services, P.O. Box 15145 Long Beach, California 90815.

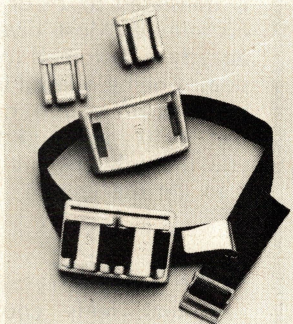


Seahawk Press announces Jerry Greenberg's newest full color sea poster entitled "Radiant Reef." Capturing the essence of Caribbean reef diving, this beautiful reproduction is 19 by 25 inches and printed on heavy poster stock. This print may be purchased separately for \$3.50. It may also be ordered directly from the publisher in a set of five posters for \$15. A great gift idea for divers. Available from Seahawk Press, 6840 92nd Street, Miami, Florida 33156.

Super Q Lite, the most powerful compact dive light available today. Featuring long life halogen bulb, transparent Lexan® case, rechargeable nicad battery pack good for 90 minutes average use, complete housing and switch protected behind a massive O ring. Dimensions: 1¼" x 7¼", weight: 9 ounces. \$39.95 with AC charger.(12V. auto charger available) Holder for arm or leg \$5.95. Contact Underwater Kinetics, P.O. Box 2125, La Jolla, California, 92038.



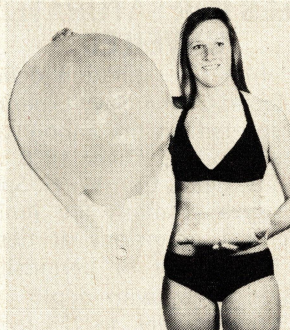
Healthways' Scubamaster™ Weight System carries all your lead comfortably out of the way on your hips. Special 2 and 3 lb. weights slip easily onto nylon webbing and nest securely into the contoured 5 lb. hip weights. Quick release stainless steel buckle. 10 lb. weight belt system includes: belt, buckle, and two 5 lb. weights. Price: \$22.00. Available from Healthways, P.O. Box 45055, 5340 West 102nd St., Los Angeles, California, 90045.



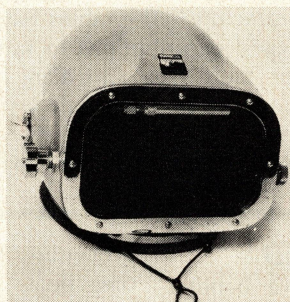
Glenn Beall Industries introduces their Gauge Bag. This handy bag is an 11" square made out of bright red terrycloth with drawstring and a diver down stripe. A partition divides the bag into two compartments that provides protective cover for many other items such as: cameras, face masks, decompression meters, etc. Priced at \$6 plus 50 cents for shipping and handling. Available from Glenn Beall Industries, 887 S. Route 21, Gurnee, Ill.



Dacor adds a new mask to their line of dive gear. The new DM40K Trivue Mask offers a superior 180 degree peripheral view and maximum downward vision. Featuring double feather edge seal for a more comfortable fit and flexible side panels that allow conformity to a wide variety of face shapes. The diver may, at his option, have a sealed purge valve cut open. Priced at \$25, it is available through Dacor Corporation, 161 Northfield Rd., Northfield, Ill. 60093.



Hypro Products offers a new and unique U/W lift bag. The orange, model HY100, is molded in one piece of tough, pliable polyethelene with a solid brass grommet for long life under rugged conditions. The compact, light-weight unit is easily transported. The bag will not rot or mildew, has no stitching to wear or ravel. Lifting capacity is more than 100 pounds. Price: \$14.95. Hypro Products, P.O. Box 167, Millville, New Jersey, 08332.

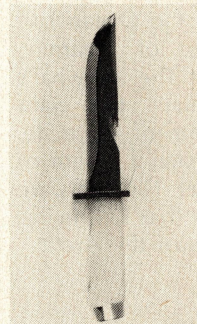


Carson Systems introduces the Mark III Air-Hat, designed to be used for construction in depths less than 300 ft., and made of rugged fiberglass with a Lexan® faceplate and chromed brass fittings. Comes with jocking system and interchangeable headliner available in three sizes. Also comes with bail-out attachment. Includes communications. Prices: \$675 to \$850. Carson Dive Systems, 20625 South Belshaw, Carson, Calif. 90746

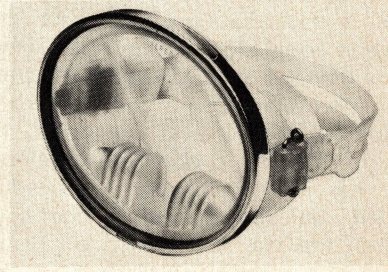
Scubapro adds the convenience of two 25 gram CO₂ cartridges to their new Gas Inflated Buoyancy Compensator. On the surface, each cartridge can almost provide the 35 lbs. of the total buoyancy of the bag. At 66 ft. deep, the two cartridges provide 22 lbs. of lift. The inflator hose, connected to the left side may be positioned in 12 different ways. Catalog no. 564 sells for \$110. Contact Scubapro, 3105 E. Harcourt, Compton, Ca. 90221.

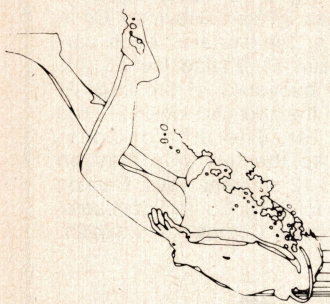


Wenoka Cutlery is introducing their new dive knife. It features a sharp cutting edge, sawing area and a sharp notch for cutting fishing line and rope. Features a comfortable, easy-grip molded handle with heavy, stamped guard. Overall length 11½", blade length 6¾". \$24.75. Catalog number is 9098-B-Y-R. Available from Wenoka Cutlery, a division of Schur, Inc., P.O. Box 765, Framingham, Mass., 01701.



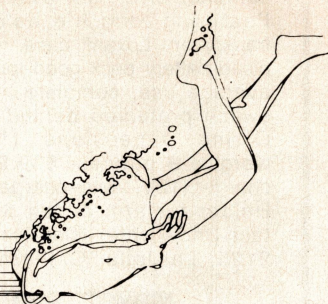
Scubapro has taken a special interest in the allergy problems of divers. After considerable research, they have made available the H/T (Hypoallergenic/Translucent) Mask, made of a compound and curing process that greatly reduces incidence of allergies due to rubber or neoprene materials. This compound is extremely soft, yet far more durable. Catalog No. 270 is sold for \$25. Contact Scubapro, 3105 Harcourt, Compton, Calif. 90221.





News Briefs

By Hillary Hauser



TOOTH CUP

During the Middle Ages emperors and kings paid high sums for drinking cups supposedly made from the horn of the fabled unicorn, in the belief that the horn would detoxify poison. The power of the horn was as much a myth as the unicorn, yet the long, twisted ivory horn did exist. Where did it come from? The narwhal, according to the Ocean Living Institute of Kearney, New Jersey. The narwhal's horn is actually the giant left front tooth of the male, which can reach a length of almost 10 feet. Narwhals are small whales that live in remote regions of the Arctic.

CAVIAR COMEBACK

Caviar is coming back. That's the news from the Caspian Sea, where Soviet fish specialists have been restocking sturgeon like mad. In an effort to get a faster maturing hybrid, the scientists have been cross-mating various species and pushing conservation rules. Now the word is out: the Caspian's sturgeon population is about 200 million, or at the 1930's level. More than 90% of the world's sturgeon live in the Caspian, and the caviar decline has in the past been blamed on the dropping level of the sea.

NEW TABLES FOR SATURATED DIVING UNVEILED

New diving tables for saturation diving excursions have been developed by the Navy Experimental Diving *Science News* reported on the announcement, which was made at the Working Diver 1976 symposium at Battelle, Columbus, Ohio. Cdr. W. H. Spaur explained that the new tables establish the limits to no-decompression vertical excursions at depths between 150-1000 feet. The extent of permissible unlimited duration excursion varies with depth: at 150 feet a diver can go 75 feet deeper, to 225 feet, for as long as he wants without having to decompress on returning to 150 ft; at 820 ft., the excursion range is 180 ft. A separate table tells how far up a diver can go from his deepest depth; at 1000 ft. a diver can move up to 820 ft. and down again without bends risk. One stipulation is that the ascent/descent rate never be more than 60 ft. per minute. The tables have apparently cut the saturation decompression time to the surface in some instances, but Spaur cautions: "You've got to use the Navy saturation decompression procedure or a reasonable facsimile, such as tables in use by some large diving contractors." The tables have been called "one of the biggest contributions to saturation diving in a decade or more" by Christian J. Lambertsen, director of the U. of Pennsylvania's Inst. for Environmental Medicine. Says Lambertsen, "It will be a stepping stone to almost everything that will be done in saturation diving from here on."

EDBA FORMED

Dive boats have banded together in the New York-New Jersey area to standardize diving safety techniques and procedures. Called the Eastern Dive Boat Association, the group has been developing wreck diving procedures, emergency rescue operations in the case of bends, and operational

procedures for two or more dive boats anchored in the same area. Capt. George Hoffman, president of the group, feels that EDBA fills a gap in the format for safety in open-water diving and invites anyone to inquire about the group's tried and tested techniques. Write: EDBA, 61 Reimer St., Somerville, New Jersey.

DIVING METRICS

With the U.S. soon to convert to the metric system, divers may well begin to learn how it applies to their sport. A 71.2 cu. ft. tank is approximately 12 liters in size; tank fill pressure is roughly 200 atmospheres (2475 psi equals 168.4 ats; 3000 psi equals 204 ats.); the assumed surface breathing rate of 1 cu. ft. per minute is translated to 24 or 25 liters/minute. Most divers are already accustomed to water depths being relayed in meters, but if you're not, 33 feet is 10 meters. (Roughly, you multiply the meters by 3 to get the feet.)

WORM FARM

Natural reefs could be built to protect beaches from erosion, and it all has to do with hairy little worms known as sabellariids. They build tunnel homes out of bits of sand and shell floating in the water and cement the pieces together by secreting an epoxy-like substance. Dr. David Kirtley of the Harbor Branch Foundation, Fla., discovered the worms in tunneled rock and is now advocating sea worm farms. An experimental farm is planned off the shores of Indian River County. Kirtley sees one million of these critters building natural reefs at the rate of one centimeter an hour.

PURPLE BUG

A purple pigment in a species of saltwater bacterium converts sunlight into chemical energy, much the same way as chlorophyll works in a green plant. That's the finding of a team of scientists from UC San Francisco and NASA's Ames Research Center. The organism, *Halobacterium halobium*, is the first organism known to carry out the important life-giving process of photosynthesis, without recourse to photosynthesis. According to a *Los Angeles Times* report by George Alexander, the discovery is considered significant because it may be used to 1) develop a bacterial screen that would concentrate salt on one side and fresh water on the other (hence, desalinization of sea water), and 2) develop a solar cell that would generate electricity. A cell has already been made which uses this bacteria. The purple pigment system is less complicated than the chlorophyll system, and scientists hope that its simplicity will enable them to understand the complexities of the chlorophyll process. The purple protein operates on light rather than energy. As it moves back and forth across its membrane, it piles up protons in a greater concentration on one side, and in the process creates an "ion-gradient," or imbalance of electrical charge.

SAVE THE ATLANTIC

A group called the Oceanic Sailing Society is trying to save the 185 ft. schooner *Atlantic*, now lying nearly submerged on her side in the harbor at Norfolk, Virginia. The sinking was indirectly caused by Hurricane Eloise, delays in drydocking, and her fragile condition. The Ocean Sailing Society is dedicated to the preservation of large, historical sailing vessels. The *Atlantic* is one of the most famous U.S. racing yachts. she was built of wrought iron in 1903.

IN AND AROUND THE BENDS WITH URANIUM

Are some divers more susceptible to bends than others? The question has been around for a long time, and now a pair of British scientists believes it has a possible answer. It all has to do with the uranium content of the diver's blood, and those individuals with an above-average amount may be more likely to get hit by the dreaded disease.

For some years Professor Dennis Walder and Tony Evans, of the decompression sickness team of the British Newcastle Royal Victoria Infirmary, have been using ultrasonics to investigate bubble information in man during decompression. They now believe that random spontaneous nuclear fission of uranium nuclei in the body may form steam pockets from which bubbles can grow in the super-saturated body tissues. A report in London's *Offshore Engineer*, sent to us by reader Scott Jordan, said that Walder and Evans found that the average man possessed about 100 micrograms of Uranium 238, enough to produce a nuclear fission every three weeks. "As a nucleus disintegrates," says the report, "it releases energy which causes the surrounding body fluids to boil, causing a steam pocket. The inert gas in the diver's super-saturated bloodstream diffuses into the steam pocket, forming a gas nucleus which during decompression may expand and branch off to form the deadly bubbles which cause the bends. The two scientists established their uranium theory by introducing soluble uranium salt into the de-bubbled, super-saturated fluid and watched the bubbles form as the uranium broke down. It led to their belief that divers with a higher uranium content are more susceptible to bends, and they are now conducting further tests, establishing uranium levels in certain individuals through urine analyses, and measuring degrees of susceptibility to decompression sickness once the uranium levels are known. Walder and Evans believe that uranium could have a similar role in bone necrosis situations.

HISTORIC SALVAGE

A plan to salvage artifacts from John Paul Jones' flagship, *Bon Homme Richard*, has been granted national recognition by the American Revolution Bicentennial Administration (ARBA). This summer the project will begin off the Yorkshire coast of England where in 1779 the *Bon Homme* sank after capturing the British frigate *Serapis*. (It was during this battle that John Paul Jones said, in answer to a challenge to surrender: "I have not yet begun to fight.") The expedition, organized by the Atlantic Charter Maritime

Archaeological Foundation, will first probe the ocean floor with sonar devices to locate the wreck, and all artillery will hopefully be lifted from the ship by the end of 1976. Another two to three years will be spent salvaging the rest. A book will be published and television documentary produced in conjunction with the project. With the cooperation of France (who may own the hull) and England, the remains of the ship will be brought to the U.S. and possibly displayed at the Navy Museum in Washington, D.C.

EARTHWATCH

"... is no picnic." So goes the ad for a new kind of operation that calls itself a research expeditions clearinghouse. "It is a clearinghouse where scientists from all over the globe can bring in important ideas. Ideas requiring far more than the efforts of any single researcher." At Earthwatch's Center for Field Research, Belmont, Mass., academic review and feasibility studies are conducted and then the organization works with the scientist to package the expedition. Earthwatch expeditions are open to "practically anyone between the ages of 16 and 75 wishing to be a part of a scientific journey," and they run the gamut from exploration of subtropical rainforests and diving the shipwrecks of the Mediterranean, to examining the astronomical markings of Bolivia. If you're interested, write Earthwatch, Cal-American Bldg., Suite 106, 567 San Nicolas Dr., Newport Beach, Ca. 92660.

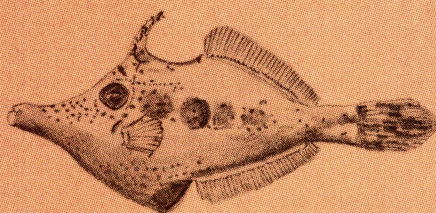
ODDS & ENDS

A possibility: a U.S. Diving Museum in Panama City, Fla. NEDU is soliciting comments on the idea. . . A Manhattan federal court has awarded \$602,000 to the Yugoslav owners of a ship accidentally rammed by a U.S. nuclear sub off Spain in 1968. The sub was on maneuvers 40 miles west of Cadiz when it surfaced and punched a hole in the bow of the ship. . . Pelicans at West Anacapa Island, Calif., may be helped by the Fish & Wildlife Service and the Calif. Fish and Game, if the Natl. Park Service has its way. NPS has asked that the two departments arrange to gather injured young, carcasses, eggshell fragments, etc., to determine what the status of the bird is since the ban of DDT on nearby coastal lands. . . An underwater historical park is planned for the Thunder Bay area of Lake Huron, near Alpena. Protected will be the numerous old wrecks in the area. . .

The Slender Filefish

(*Monacanthus tuckeri*)

The word *Monacanthidae* comes from the Greek meaning "one spine," and is the name of the species commonly referred to as filefishes. The flagpole-like spine on top of the head of the filefish is a variation of the dorsal fin theme of other fishes, and is the distinguishing mark of the family. Some ichthyologists classify the monacanthids as their own family while others include them in the Balistidae family of triggerfishes (balistids) and filefishes (monacanthids and aluterids). All are members of the plectognath fishes (triggerfishes, filefishes, trunkfishes, puffers, porcupinefishes), which have the spinous dorsal fin. The filefishes have more compressed bodies than the triggerfishes, have a less developed dorsal spine apparatus, and the skin is more velvety or spinulose. The hide of the filefish, when dried, is sandpapery to the touch and at one time was used by sailors to strike their matches. □ In the Bahamas, the slender filefish is the smallest of the family and can also be distinguished from the other monacanthids by its narrower, more slender body. The head is longer and characterized by a more prominent snout. *M. tuckeri* is yellowish brown to brown, with large straight-sided blotches. There is a row of dark brown spots that forms an indistinct band midlaterally. There is a series of well-developed spinules on the sides, and on our pictured specimen these can be seen just below the dorsal fin base. There is often a patch of these spinules just in front of the base of the tail, more developed on males than in females. The slender filefish only grows to a maximum of two and a half or three



adult species

inches. □ Divers will generally find that all filefishes are solitary and shy. They are quite amusing to watch as they try to camouflage themselves next to pilings, rocks, reefs among plants or gorgonian fronds, from which they never stray far. Very often they will hang vertically suspended, head up or down, next to some object as they try to resemble what it is they are hiding behind. They are also able to change colors at will to match their environments, becoming very pale over white sandy bottoms, darker when around grassy coves and patch reefs. They have other built-in protection devices, such as a unique ability to distend their stomachs, which supposedly makes them look like bigger fishes in the eyes of their predators. Most filefishes are not strong swimmers and stay close to the bottom. While they hang suspended in an unfishlike posture,

they often have their eye on their prey, darting straight down to nab their meals. Ichthyologist Jack Randall found that *M. tuckeri* feeds primarily on organic material, copepods, gastropod larvae, a few unidentified crustaceans, and isopods. While many filefishes are believed to eat corals, Randall has only found one West Indian species with coral in its stomach. □ The slender filefish, called Tucker's filefish in the past, is solitary by nature, and the diver will usually see it alone as it tries its best to keep hidden. It stays in relatively shallow water; ichthyologists James Bohlke and Charles Chaplin have never taken it below 25 feet. They have recorded it from Bermuda and the Carolinas to southern Florida and the West Indies. 🐟

Photo By Fred McConnaughey - Text By Hillary Hauser

Photo taken off Bonaire. Photographer Fred McConnaughey used a Nikon F2 camera with a 55mm Nikon macro lens, flat port, Honeywell 782 strobe, Kodachrome 64, 1/80th second at f16, six inch distance from the subject.



UPCOMING FILM FESTIVALS

Seamark '76

BY BOB PRICE

It has not been so long since members of the underwater fraternity has a reputation albeit generally unearned, of being loners, concerned only with their own needs and occasionally those of their brethren. However, times are changing, and divers are increasingly being recognized as willing to get together with other users of the water, and with local communities, to ensure that the rights and needs of everyone are considered as each pursues his interests.

There is, however, another area where divers and dive organizations can have a beneficial impact, and that is in helping some of the less fortunate people in the community. In New England last fall, the dive fraternity did just that in a project called Seamark '75, aimed at helping a group of delightful, but unfortunately physically handicapped, youngsters at the Cotting School for Handicapped Children in Boston. Seamark was originally conceived by Frank Scalli, who has long had an interest in the school and its children, and was kicked off by a \$1000 donation from the Boston Sea Rovers, immediately followed by a \$1000 donation from the Massachusetts Elks. Seamark '75 took the form of an underwater exhibition, cocktail party and dance at the New England Aquarium and Pavillon on Saturday, October 11, 1975. Some of the great names in the underwater world were there, mingling with the crowd, and the evening was a great success, raising over \$10,000 for a Vision Clinic for the children of the Cotting School.

The Vision Clinic has now been built, and under the direction of the Massachusetts College of Optometry, started operation on January 12, 1976. It has already produced some startling results, including the previously unknown fact that all but one of the first and second grade handicapped children have only monocular vision. In most cases, having discovered this condition in time, the children can be restored to normal binocular vision, but without the clinic their vision would have been impaired for life.

However, the clinic is still desperately in need of funds for the highly complex equipment needed for this type of operation. Devices with the tongue-twisting names of Ultramatic Phoropter and CLL Ophthalmometer are necessary for proper diagnosis and optical treatment of the children. Further help is needed from the divers of the Northeast.

At the John Hancock Hall in Boston, during the Boston Sea Rovers 1976 Un-

derwater Clinic, Seamark '76 was announced, to be held at the New England Aquarium on Saturday, October 9, 1976. Proceedings will include a show in the main tank, special slide and film features, a special dolphin show by the Aquarium staff (cetaceans and people), a cocktail party (people only) and dancing. Again some of the great names in diving have promised to appear, including Dr. Eugenie Clarke, Stan Waterman, and Dr. Harold "Doc" Edgerton. The Boston Sea Rovers have again contributed a check to start the drive off, and the divers of New England will surely rally round again to demonstrate their responsibility and responsiveness to the community at large.

For further information concerning this event, contact either Bob Price, Publicity Director, or Tony Salerno, Chairman at One Pine Road, Beverly, Mass. 01915. 🐠

San Diego Film Festival

With a history of contributors like Ron and Valerie Taylor (Jaws and Blue Water, White Death), Bates Little Hales (National Geographic), and Lamar Boren (Sea Hunt, James Bond—007) over the years, it's no wonder the San Diego Underwater Film Festival draws capacity crowds year after year.

This year's 12th annual edition, Sept. 17-18, will more than likely be no exception. In fact, this year the San Diego Civic Auditorium expects almost 3,000 viewers each night at each of the two 8 p.m. openings.

The first step in the 1976 film festival was a search for this year's host to emcee the event. San Diego Underwater Photographic Society Festival chairman Bob Lee selected Skin Diver Magazine editor and publisher Paul J. Tzimoulis.

Tzimoulis has distinguished himself as a writer, photographer and lecturer as well as being a former commercial diver and scuba instructor. He is also an outspoken marine conservationist covering over a half million miles in the course of his travels.

Each night's show is completely different from the other and will consist of three slide presentations of five to ten minutes and four films each lasting 20-30 minutes.

One of the featured films is *Sea Creatures* by academy award winning documentary filmmaker Robin Lehman. The film short is an undersea 'Candid Camera' catching different creatures in amazing and strange sequences set to interesting sound effects.

The film lasts 20 minutes but took over

two years to film and contains some of the most exotic footage yet seen of undersea animals.

In addition to the slides and films are the collection of still photography exhibited on the second floor of the Civic Auditorium. Among the still presentations are eight photos taken in the Mariannas Trench at the deepest point ever recorded by man.

The San Diego Underwater Photographic Society will display its extensive collection of antique and modern underwater photo equipment showing the evolution of underwater photography.

This year's San Diego Underwater Film Festival promises to be one of the best events of its kind in the nation this year. The cost is \$4.00 per night for each person, reasonable considering the many thousands of hours of work that went into the photography on display.

The San Diego festival will have something for everyone from the accomplished underwater sea explorer to the weekend skin diver.

The non-reserved tickets will be on sale at the door of the San Diego Civic Theatre, 202 C St., San Diego, as well as from the San Diego dive shops. If you wish to receive yours by mail send a stamped, self-addressed envelope, plus \$4.00 for each ticket to: Tom Southard, Jr., 4130 Park Blvd., San Diego, Ca. 92103.

As in the past a beautiful souvenir program will be given to attendees. Last year's booklet contained 28 pages of full color and black and white underwater photographs. This year's will have more color photos, one which will be an 8 X 10 suitable for framing. If you are unable to attend you may receive a copy by sending your name, address and \$2.00 to "PROGRAM", UPS of San Diego, P.O. Box 82782, San Diego, Ca. 92138. 🐠

Inward to the Sea, 1976

BY JOHN LUDWIGSON

What secrets lurk in the heart of Loch Ness? Only shadows — which might be a monster's head, or just shadows — appear on the underwater photographs taken to date. Sonar echoes reveal there is something there, but not what it is.

The truth about Loch Ness, or a good explanation of why this year's expedition failed to uncover it, will be one of the attractions at the 5th Annual Inward to the Sea, September 25, in Washington, D.C. Expedition member Charles Wyc-koff of Needham Heights, MA, will conduct a seminar on the search for Nessie as part of the day long program of this international festival of underwater films and activities.

Inward to the Sea is a full day of seminar/discussion sessions on oceanic topics, culminating in an evening screening of some of the finest in underwater motion pictures and a reception at which

participants can mingle with the speakers. During the day, manufacturers' exhibits of diving equipment and services will be set up outside the seminar area. The program is held in Lisner Auditorium on the campus of George Washington University in downtown Washington.

Inward to the Sea 1976 continues the International Ocean theme begun last year, with contributions from Japan, Sweden, Bermuda, Scotland, the Caribbean area, and other parts of the world.

The day begins at about 9:30 a.m. with the first of the seminar sessions. In addition to the Loch Ness report, these will include a multi-media presentation on underwater photography of the Caribbean by Dr. Logan Holtgrewe of Silver Spring, MD. Dave McLeod, a native of Bermuda, will add a film on Bermuda diving and a discussion of that unique island's underwater features — and above water facilities.

Swedish Environmental Attache in Washington, Carl Lindstrom, will continue the reports on Nordic underwater activities begun last year with a presentation on diving in Sweden. From Japan, an embassy representative will offer a film and talk on one of the ocean oriented nation's specialties: aquaculture (of fish, shellfish, and seaweed).

A report on that medical bugaboo of divers, aseptic bone necrosis, will be given by Commander Claude Harvey, Medical Corps, U.S. Navy, of the Naval Submarine Medical Research Laboratory, Groton, CT. (Cdr. Harvey has also been involved in recent experiments on nitrogen saturation and may be persuaded to expand his talk.)

The evening film festival begins at 7:30 p.m.

A swim with a whale shark — one of the most imposing, if also harmless, real monsters of the deep — will be featured at the evening festival. The film of a 60-some-foot-long whale shark that appeared off Bermuda will be presented by Dave McLeod. The shark appeared as McLeod and companions were diving near the Argus Island research tower southwest of Bermuda, and hung around for several days while they expended every inch of film they could find photographing it.

Robin Lehman, the two time Academy Award winner, will be back this year with another of his short-feature gems. This one is entitled, simply, *See*. To round out the evening, Inward to the Sea will present the original pilot film from the Lloyd Bridges series, *Sea Hunt*.

Tickets will cost \$3 for the seminars; \$3.50 for the film festival; and \$5 for the post-festival party — a total of \$11.50 for the day. They're available from: Inward to the Sea, P.O. Box 41010, Washington, DC 20014. A new feature this year is an information telephone line. A regularly updated announcement of program information can be had by dialing (202) 347-0206.



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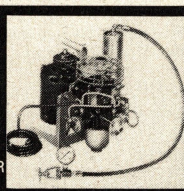
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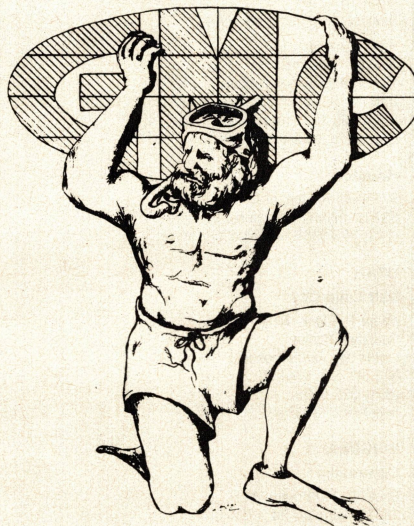
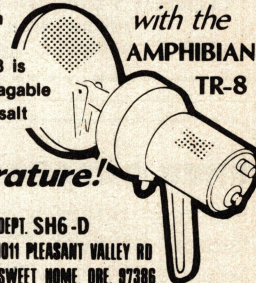
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Scuba Duba Too Opens in Reseda

Jim Ashenbrenner, owner of Scuba Duba Dive in Studio City, Calif. for 16 years, has decided to dive into the Reseda area with another professional shop. Scuba Duba Too, located at 7126 Reseda Blvd., was formerly Photomarine Int'l.

The new location is quite a change, an additional 4000 square feet of selling and showing area. There's room for everything from snorkels to an indoor pool (that's planned for the future). Along with the change, a new 15T4 Ingersoll Rand 36 cfm compressor with ASME storage and booster made its showing. It is capable of 4500 psi and is the show-off of the shop. Everyone that comes in gets the grand tour and that's the first stop — the compressor room.

If you'd like a quick tour, the second stop is a look at the diving gear. There are new rentals which include suits, tanks, regulators with gauges, B/C's, weight belts and all the accessories. Third stop is the 700 square foot class room complete with the latest training aids. Fourth stop on the tour is the Scubapro Audio Visual System. Everyone seeing it for the first time finds it fascinating, particularly as the visual aids make even the mundane interesting. Last, a look at the spacious repair area.

With the addition of the new shop, Scuba Duba Dive will be able to offer a new class starting every week at alternate locations. Also offered are boat trips every weekend, plus a special five day trip to Mexico this summer with their active club, Scuba Duba Whalers.

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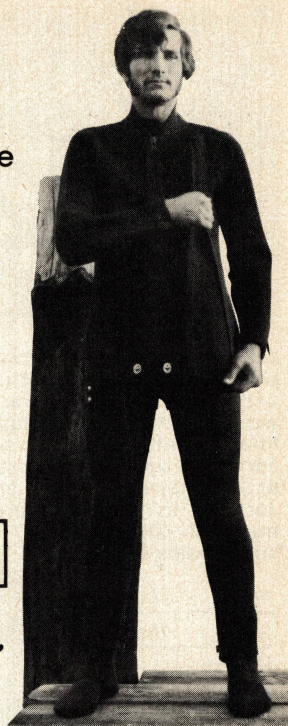


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After three days of watching Bruce, Sommerville obtained an air ambulance to fly them to the hospital in Tucson, Arizona, where Bruce recovered.

On May 4, 1976, the American Red Cross awarded Sommerville the highest national honor obtainable signed by President Ford. To be eligible for the award, the recipient must save a life using methods learned in a Red Cross lifesaving class.

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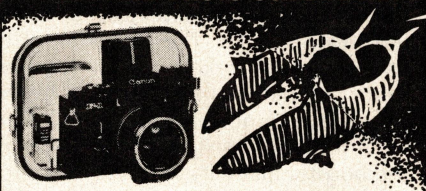
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A Real Gem of a Story

from California's Big Sur

By Don Wobber

It wasn't the lure of sunken treasure or the desire to see ourselves in the *Guinness Book Of World Records* that had sent us back to Jade Cove (SKIN DIVER, May, 1974). Gary Carmignani and I were interested in making a movie to document the thrill of raising a large piece of jade up from the bottom of the sea — it was our friend Jim Norton who came up with the "biggest and best" concept.

Jim couldn't see why we couldn't get the biggest and best hunk of jade to ever come out of the sea. We soon located such a boulder and christened it Nephripod (a pod of nephrite jade).

Jim was the engineer type. He knew just how we would

take the Nephripod. Easy, on paper: just slide the 4½ ton, 8½x5½x3 foot gem onto a steel sled, chain it down, put 50 gallon steel drums and lift bags on it, raise it, tow it down the coast to a beach where it could be wrestled through the surf and onto a trailer he would build. Then drive away. That was it. Easy!

Jim was a good technician, but he hadn't figured a lot of things. The coast down there is rugged and the water seldom calm. Tanks and other gear had to be manhandled both down steep switchback trails and across beach rubble in the form of large boulders to the shore, then transported through surf to the site, then back again. The Neph-

ripod, only a few hundred yards offshore, was in a tight setting, surrounded by rocks, one, a small island we call the Cave Rock (it has a cave through it — walls of jade!). Further, it was jammed in place by a 350 pound wedge shaped rock.

While it only took us three days to pry the wedge shaped rock loose, to our dismay, we discovered that a ledge hung down over the tip of the Nephripod that would keep us from pulling it loose. O.K. We would chip the ledge off. We brought out chisels and 12 pound sledge hammers and went to work.

The ledge would not be split — it was tough. Analyzing a chip on shore, we found the ledge itself was nephrite jade — not good quality, but definitely nephrite. Nephrite jade is not the hardest mineral; on Moh's scale only 6 to 6½ as compared to diamond at 10. But it is the toughest, the very toughest! This is because it has a fibrous microstructure and the fibers overlap, an admirable trait — unless you're trying to split it. In spite of this, over the next few months, whenever the water was somewhat calm, we were out chiseling at the ledge. Our progress was slow to say the least, but having no alternate plan (dynamiting down there being illegal — besides dynamite fractures jade), we decided to chisel away.

On the morning of February 10, 1971, the date after an earthquake destroyed a large section of the San Diego Freeway, Gary and I stood on the cliff gazing down at the cove wondering if it was calm enough to dive. The wave pattern was very erratic indeed (affected by the quake?). Seven or eight large sets of waves would roll through followed by long period of relative calm. We swam out. The night before we had left a Portapower, a cylinder shaped hydraulic tool capable of tremendous power on its chisel shaped end, wedged between the Cave Rock and the ledge in hope that the force of the Portapower over time would crack the ledge. It didn't.

We began chiseling on the ledge, one using a sledge hammer and a chisel while the other wedged himself in, holding on to the worker's ankles to keep him in place.

When large sets of waves rolled overhead we abandoned our work and clung to the Portapower as we would to a railing. If we let go the powerful surge would hurl us like so much jetsam. We had little control against such power and were easily flung into large rocks. Hanging on, we counted each wave as it swept overhead. Sand and gravel pelted us like hail, and rocks weighing up to five pounds occasionally tumbled by. When seven or eight surges passed and the water calmed, we went back to work.

After a half hour of alternately clinging to the Portapower or chipping away at the ledge, a much stronger series of waves began. We clung to the Portapower counting, "seven . . . eight . . . nine . . . ten . . ." but the waves kept coming, the surges growing progressively stronger. We felt the mounting cold strength drag at our legs as we cowered against the ledge desperately. Once, our feet were pulled loose from their wedged in positions and our legs were flung out horizontally, fluttering like flags in a gale. Then the returning backwash crumpled us up against rock.

We quickly learned not to relax our legs. As the surge continued and kept on building we studied one another quizzically, shrugging our shoulders, each wondering when it would end and what to do.

Then it grew dark, as if a shade above us had been drawn. In the dim light the water, suddenly filled with swirling bubbles, kelp bits, and sand, became a sucking torrent of inconceivable fury. Although but a foot away, I could scarcely make out Gary's features. Finally I figured we better get out and get out fast so, between the next incoming surge and the backwash from the former one, I signaled to Gary and we took off for the surface, swimming out and away from the large rocks for fear we might be dashed against them.

We emerged into a terrible tilted and confused world. Walls

of water moved beneath us like freight trains and unleashed themselves furiously against the cliffs surrounding the cove, falling, tearing, beating against them. Patchy meadows of kelp had come to life, the bulb ends disappearing under crests of swells, then rising out of the deep troughs like schools of glistening serpents thrust up from the netherworld.

Our float had torn loose and was headed out to sea. Gary shouted that he would go after it and I shouted back that I would recover the Portapower and meet him on the seaward side of the Cave Rock.

I dived back into that darkened cauldron and after a long struggle, freed the Portapower. Clutching it under one arm, I held my body head downward while blowing air into my life vest for buoyancy, all the while being swept 20 to 30 feet in one direction, then back again. I tried to fend myself off with my free hand while being hurled past jagged rock outcrops, not altogether successfully. When I surfaced again the sea looked like the inside of a washing machine. Gary had the float, but was still far seaward. I kicked toward him, but under the weight of the Portapower my life vest was not holding me on the surface. I didn't know it, but a two inch gash had been torn in the vest, making it useless. Occasionally I gulped water and began to cough. When at last Gary and I met it was a great relief to roll the Portapower onto the float.

Gary had been fighting a southerly current; the waves, piling water into the cove from the north, were draining out to the south. We were being sucked out to sea, waves now so huge they broke over the Cave Rock. We felt very small. To get in at all we would have to work the float north by pumping like hell parallel to shore. As we did this, suddenly out beyond us a huge swell built up.

We weren't going to get over the top of this one; the swell would break, and there was nothing we could do. We pumped as hard as we could toward it, hauling the float between us. The huge swell gathered height, then broke, and a wall of white water bore down on us. The wall, crashing on top of us, ripped our float from our hands and flipped it skywards. I closed my eyes as I felt a sudden thump on my head, then blackness. I had been hit by the Portapower!

I couldn't have been out for more than a second. When I came to, I was enveloped in a maelstrom of swirling bubbles. I shook off the pain and clawed toward where I imagined the surface to be. Above, the sea was surprisingly quiet; a jumble of confused foam where I was riding seaward on the backwash of the wave. Then another wave struck. I fought for the bottom until I ran out of strength — then found foam and sunlight once more. Gary and the float were gone. I was alone, facemask askew, water stinging my eyes. My hand, no, my head, dripping with blood.

It was a long swim in. Gary had overtaken the float, caught good rides on several waves and was on the beach. After what seemed an eternal struggle, I was tossed on the shore by a crashing breaker and managed to crawl up the steep, pebbly beach to safety.

The sea, now tremendous, was tearing at the very foundations of the coast, wave upon wave pounding against the beach, shaking the rocks beneath. Fingers of white foam clutched at the highest rocks, and the water returning to the sea rattled the beach pebbles like old bones. The slant of the beach grew steeper. We were amazed at how quickly the water contoured the beach: the backwash of a single wave changed an area of small pebbles to a trough of fist sized stones. It was hard to believe that kind of sea could come up so suddenly. We had been lucky to get out alive.

The sea stayed rough for three weeks.

The frustrations of the continual chipping of the ledge led to Plan B, which none of us really had faith in. Plan B was to put a house jack under the 9000 pound Nephripod and dig beneath



Author Wobber gets his gear together for an assault on the gem.

it. When we took the jack out and pulled on the Nephripod, it would drop down, clear the ledge, and we'd have it.

Shovels would not work for the digging operation. Material just slid off the blade — but we found a garden hoe could effectively drag sand or gravel out from under. We were lucky: our work revealed the bottom of the Nephripod to be flat. We ran into heavy clay and rocks (some of them jade), but attacking with crow bars, these were little problems, and after a few weeks of work we had a trench one foot deep and an arm's length wide beneath the shoreward edge of our treasure.

Meantime, we picked up another diver, Sonny Phillips, who was a great help underwater. Wrapping chains around the Nephripod and pulling with the help of griphoists and pulleys, we gradually edged the huge rock out. It went up against the ledge again as we shifted it onto the sled, but by putting a tremendous strain on our equipment (and ourselves), we bullied it through, breaking small pieces off the ledge as it went.

At last, six months after our decision to take the Nephripod, the huge jade gem lay on the steel sled like a lifeless corpse, a great dead Gulliver beneath its net of high tensile strength chain. Our lifting equipment began to bring it to life as Sonny and I added air to lift bags. Suddenly it gave a shudder and we could feel it shift beneath our hands ever so slightly, moving with the surge. Our sleeping giant was awakening.

The load was still on the bottom, but as the sled pivoted on its heaviest corner the three other corners rose from the sand. Then we could no longer hold it. The whole sled swung, pivoting around the low point, sweeping in an erratic semicircle and then back like a giant scythe, challenging everything in its path. As the burden lightened more, the sled began to travel back and forth with the surge, lunging shoreward, pounding against large rocks, pausing, then moving back again and chipping or crushing smaller ones. It swept back and forth like some awesome battering ram, taking us with it. We moved cautiously, trying to keep fins and limbs out of the way, all the while furiously tying on and filling additional lift bags. Whenever possible, we worked above the rock, reaching down among scores of inflated black bags to tie on more bags.

I forgot the Nephripod was traveling along the bottom and taking me with it, and as I reached over a drum to fill a bag, the sled shifted toward me dragging me backward and pinning me against the ledge. I put my hands against the steel drum instinctively, but it knocked the wind from my chest and kept coming until I was squashed against the ledge. I strained against the drum but there was no resisting such weight. Then the surge changed direction and the sled moved away. I got out.

I was afraid that before it raised the whole mass would get loose and move out into the open. If that happened, it would probably be thrust 15 to 20 feet one way, and then back again

as we had been tossed about by the heavy surges of midwinter. That tremendous weight banging up against the Cave Rock could shatter steel drums and tear bags, ruining our equipment in short order. Confined as it was it was making three to four foot lunges and the drums had already taken sizeable dents.

When I thought the rock ready to go I was to yank three times on the tow rope, a signal to Jim and Gary, above in the Speedyak, to start the outboard and pull seaward to keep the raising load from crashing against the surrounding rocks.

Sonny was still putting air in bags. I planted my fins on the ocean floor, grabbed the lowest corner of the sled and found I could raise it. I jerked on the tow rope, tapped Sonny on the shoulder, and signaled to him that we should try to lift the sled. On opposite corners we nodded to one another then, straining, brought the sled swiftly to shoulder height. It was still moving back and forth with the surge, but all of a sudden the air in the bags expanded enough, and we felt it leave our hands and move upward — out of control, first moving slowly, then gaining momentum. It careened against the Cave Rock which overhung on one side above, but kept on going, hurtling unsteadily, drunkenly, toward an uncertain birth above.

It is hard to say what feelings I had during that period, or how time has worked to distort my image of them — but that lift is engraved upon my mind. Closing my eyes, I see light filtering through a canopy of kelp, flickering around the rising sled like a halo of bright spokes. I see a corner of the sled swing against the overhang shattering rock and encrustations on its way up. I trace indelibly that final, agonizing route to the surface and feel again, as though I am there, the fear that equipment will be damaged on the way up and the Nephripod will come tumbling back down on top of me.

Sonny and I followed it up, swimming fast, for now it hung suspended in the water above us. When we surfaced we emerged from a silent, muffled cocoon of water into a different world, a world with a wild and obscenely noise filled atmosphere that demanded immediate answers.

Jim and Gary were shouting. Jim was struggling with the outboard which he couldn't start.

The whole cove was white with foam. Steel drums were grating against the Cave Rock. I was getting panicky — any instant now the drums would be pounded to bits and the jade would go down again. It felt like an eternity before Sonny and I realized that we could at least try to hold the sled off the Cave Rock. We saw the tow rope just beneath our fins, dived for it, and started to pull.

About that time we heard the outboard motor start and Jim threw it in gear. The tow rope went taut in our hands. Slowly, slowly, the Nephripod moved away from the Cave Rock. The little inflatable was actually pulling it!

We had done it! Now, the long tow to the Willow Creek beach and the Nephripod is ours!

Sonny and I did some frantic last minute chores as the rock moved slowly seaward. Sonny put bungs in the drums to make them airtight. I found a bag which had torn loose, then another. The night before, someone had sabotaged our lift bags by cutting the lines and stealing the fastening clips — so we had to tie them on as best we could, which apparently wasn't good enough. Jim threw me some line and I retied and inflated both bags, then Sonny and I swam around checking and filling each bag with as much air as it would take. Thin streams of bubbles were rising from some of the bags. One was leaking heavily.

It was a long swim back to the beach. Just before passing the Cave Rock we turned to look seaward and saw Jim and Gary in the Speedyak on the crest of a swell, behind them a low black island of bags. To me, there seemed to be only a four or five bag margin showing above the water. While a five bag margin would equal a 1000 pound safety factor, the loss of only five bags would be catastrophic. Also the sea was rising, and each time the rock slid to the bottom of a trough, the force of all that thrust would submerge the bags somewhat more, resulting in increased pressure, decreasing the volume of air within each bag and

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causing a loss of buoyancy. I looked at the rising sea and felt a fresh west wind blow cold on my face.

Sonny shook his head dubiously, "I don't think they're going to make it!"

They didn't. Sonny and I, peering northward across rough waters from the beach at Willow Creek, watched the Speedyak and its burden fight rising seas in an attempt to round the point. Suddenly, we lost sight of them. We thought they had sunk. After an hour's futile search from the cliffs along the coast, we went back to Jade Cove and found Jim and Gary just getting to shore — no Nephripod. It went into a deep trough and just kept on going — sunk at sea in 70 feet of water. We had lost.

But a marker was on it, and two months later, after a pirate and killer whale scare, much rough water, and many other misadventures, we brought our prize ashore. Three days later we muscled it across the beach of mammoth boulders and onto the trailer.

Our adventure did not end at the beach. We towed our gem on its trailer out of Willow Creek and up the Coast Highway. Thirty miles later we were reined to a screaming halt by the siren and the red light of the local sheriff's car, and a rather large sized sheriff extracted himself and soon explained to us that a lady had called, claiming that someone was stealing a "national monument." After a brief inspection of our catch, now dripping and stinky with rotting sea life, he checked in with headquarters to confirm that no one, at least recently, had taken a national monument. Reluctantly, he let us go.

The Nephripod (valued anywhere from \$10,000 to \$4,500,000 visited a gem and mineral show; then we took it on a movie making jaunt through San Francisco's Chinatown, stopping often to film delighted people rubbing the huge stone. Soon we had not only international publicity, but a place in the *Guinness Book of World Records*!

However, the state of California, getting wind of our caper, claimed the jade for themselves, saying that since it was found on state property, technically it belonged to them. So began a 14½ month tug-of-war of intrigue and legal jargon: us against the somewhat humorless State Lands Division, state of California. But the story ends on an upbeat. Finally, we gained clear title from the state in an out-of-court settlement.

So 23 months after we first decided to try for the jade giant from the Big Sur, we drive off into the sunset happily hauling our 5000 pound Nephripod!

The complete story of the jade caper and the struggle with the State of California is told in Jade Beneath The Sea — A Diving Adventure. By Don Wobber (Boxwood Press, 183 Ocean View Blvd., Pacific Grove, Calif. 93950, \$3.95).

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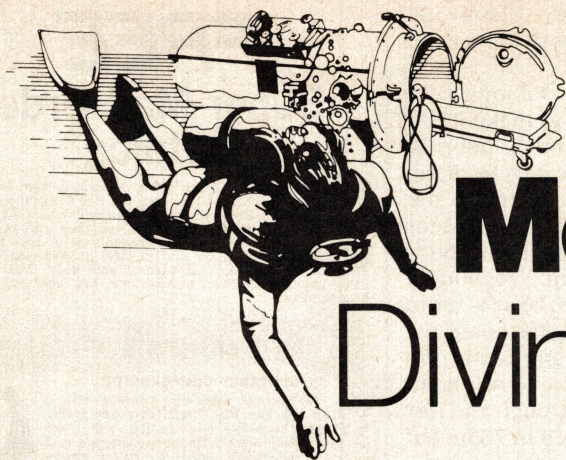
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Medifacts

Diving Drugged?

By Chas. V. Brown, M.D.

When a sport puts us in an environment as uncompromising as the ocean, it becomes important to minimize the risk factors. Among the least understood of these are drugs, so let's explore what they can do to a diver.

Physiologically, life consists of a lot of biochemical reactions, and it is on this fundamental level that drugs work. While they can affect all processes, those that concern us most influence one's autonomic system, or one's behavior. The autonomic system regulates things on the subconscious level: it keeps you breathing when asleep, fits your pulse and blood pressure to changing needs, and so forth. If it's upset, your organs do strange things and you don't adapt well to changing conditions or stresses. On the other hand, when something distorts your sensations, perceptions, thought processes, or muscle control, your behavior will be abnormal.

In general, medicines taken to relieve common symptoms have autonomic activity. Unfortunately they all have side effects which are usually adverse. We'll start with America's favorite pill, aspirin — we eat over four tons daily! To scotch a recurrent rumor, it does not cause hypothermia. It will take a fever down to normal, but apparently not below. It gives some people a sour stomach, though, which makes antacids a good idea. Its greatest hazard occurs because it works: it may, relieve an ill person's symptoms enough to encourage him to dive when he shouldn't, and so lead to trouble such as decompression sickness.

The commonest medical problem in diving is clearing one's ears. The membrane lining the eustachian tube is congested with blood or swollen with tissue fluid. Decongestant pills or nose sprays shrink the blood vessels, and antihistamines block the vasodilation and mucus production caused by allergy or infection. Many divers take a pill which combines these. Decongestants stimulate and antihistamines sedate, but sensitivity varies so much that a combination pill will make one fellow jumpy and

the other drowsy, though most people tolerate it well.

Antihistamine side effects include dry mouth from reduced saliva and blurred vision from dilated pupils. A decongestant nose spray may wear off during a dive and the rebound congestion leave you worse off than before: a setup for reverse squeeze. Frequent use of sprays causes a chronic congestion.

A special side effect of decongestants, variable but potentially dangerous, is disturbance of the heart's rhythm. Such dysrhythmias deserve respect. An astronaut was grounded when an EKG showed one he didn't know he had. Many people get so-called palpitations, occasionally bad enough to cause faintness. A scuba experiment revealed at least brief dysrhythmias during half of all sport dives. I once brought up an affected diver; without help he'd have been another drowning statistic. Susceptibility varies tremendously, even in the same person, so beware of things that tend to increase it. These include especially in high doses the decongestants; the caffeine in coffee, tea, cola, and various headache remedies; the nicotine in cigarettes; any stimulant; and other drugs like codeine, heroin, cocaine, etc.

Next, a look at antinauseants. The stronger phenothiazine drugs often prescribed for nausea aren't really much help for the motion sickness type. Besides, they inhibit constriction of blood vessels in the skin, lowering blood pressure and ruining one's major defense against cold water. They have a tranquilizing effect which may be quite inappropriate, and they disturb muscle control. Hyoscine type antinauseants (belladonna, homatrome, scopolamine) are potent. A widely quoted study showed a combination of scopolamine and amphetamine to rank highest of all agents tried against motion sickness. But possible penalties include dry mouth, blurred vision, fast pulse, and predisposition to dysrhythmias and to oxygen seizures. Certain mild agents are probably harmless but not likely to help much. The best

compromise for most divers seems to be one of the mild antihistamines like Marezine, Bohine, or Dramamine.

How about vitamins? Nothing else but beer and cigarettes has been so ballyhooed as essential for the rich, full life. There are many fine supplements available, but there's no good evidence that divers need more vitamins than other active people. Vitamin E does confer some protection from oxygen seizures, but sport divers should never have the problem. You'd have trouble convincing Greek sponge divers, Japanese ama, and Pacific islanders that high powered supplements are essential for performance. Overdoses of A and D can be toxic, and even common doses of niacin can cause a skin flush that would favor heat loss. An incomplete supplement can cause relative deficiency of the vitamins it lacks, and suddenly stopping a high dose formula can produce a temporary deficiency state even on a good diet.

Now we come to the commonly abused drugs — all taken to alter psychic experience, and all toxic to behavior. Although there's plenty of overlap, we'll group them as uppers, downers, and hallucinogens.

Alcohol is the number one downer. A six-pack of beer or four bar drinks puts one over the legal limit of .1% blood alcohol, where the accident rate is up seven times; at .15% it is boosted to 23 times. About half the people over age fourteen who drowned in Baltimore had blood levels above the legal limit. A patient of mine nearly died when he combined drinking with underwater swimming. He was too narcotized to know when it was time to breath. Alcohol also favors heat loss in cold water, decompression sickness, and aseptic bone necrosis. And if the police smell it, they may ascribe certain symptoms of decompression sickness to the booze and conduct you to the tank instead of the chamber.

Other downers include sedatives like doriden, quaalude, barbiturate (reds and yellows); minor tranquilizers like lib-

(Continued on Page 80)

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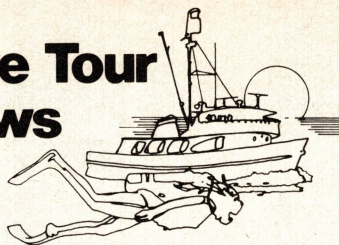
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 Aug. 2—KONA COAST, HAWAII—12 days, Sierra Club, San Francisco, CA
 Aug. 4, 18—MAJURO—9 days, Micronesian Expeditions, Salt Lake City, UT
 Aug. 6 & 20—BONAIRE—8 days, Happy Wanderer Travel, Scarsdale, NY
 Aug. 6, 20—BAHAMAS—7 days, Tropic Diving Cruises Inc., Ft. Lauderdale, FL
 Aug. 6, 13, 20, 27—BONAIRE—8 days, Lisind Int'l, New York, NY
 Aug. 6, 13, 20, 27—HAITI—5 or 8 days, Oceaneers Dive Tours Inc., Hollywood, FL
 Aug. 7, 15—BIMINI—7 days, Capt. Tom Guarino, Dive Boat Annie-Up, Key Largo, FL
 Aug. 7, 14, 21—CARTAGENA, COLOMBIA—8 days, World Wide Divers Inc., New York, NY
 Aug. 7—BELIZE—7 days, NASDS store/school, Montreal, Que. Canada
 Aug. 7—ROATAN—8 days, Go Diving, Inc., Minneapolis, MN
 Aug. 7—COZUMEL—8 days, Randy Dellis, See & Sea Travel, San Francisco, CA
 Aug. 7—CANCUN—8 days, Oceaneers Dive Tours, Inc., Hollywood, FL
 Aug. 8—GALAPAGOS—15 days, John Kelly, See & Sea Travel, San Francisco, CA
 Aug. 12—NASSAU—10 days, Capt. Ed Deckard, Islanders' Cruises, Miami, FL
 Aug. 13, 20, 27—BONAIRE—8 days, Lisind Int'l, New York, NY
 Aug. 14—ROATAN—8 days, Ski & Dive Shop, Washington, DC
 Aug. 14—BELIZE—7 days, NASDS store/school, Chicago, IL
 Aug. 14—COZUMEL—8 days, Go Diving, Inc., Minneapolis, MN

Dive Tour News



- Aug. 14—BRITISH VIRGIN ISLANDS—12 days, Trimaran Misty Law, St. Thomas, VI
 Aug. 14—COZUMEL—8 days, Oceaneers Dive Tours, Inc., Hollywood, FL
 Aug. 14—FREEPORT—10 days, Capt. LaChance, Adventure Cruises, Ft. Lauderdale, FL
 Aug. 18—FLORIDA CAVES—5 days, Berry Distributors, Inc., Alsip, IL
 Aug. 19—KONA, HAWAII—5 days, Horizons Int'l, Seattle, WA
 Aug. 20—ELEUTHERA—8 days, Happy Wanderer Travel, Scarsdale, NY
 Aug. 20—COZUMEL—8 days, Sunland Int'l Tours, Beverly Hills, CA
 Aug. 20—CHINCHORRO REEF—10 days, Sunland Int'l Tours, Beverly Hills, CA
 Aug. 21—BELIZE—7 days, NASDS store/school, Seattle, WA
 Aug. 21—FREEPORT—8 days, Go Diving, Inc., Minneapolis, MN
 Aug. 21—BONAIRE—8 days, See & Sea Travel, San Francisco, CA
 Aug. 25—FREEPORT—7 days, Capt. Ed Deckard, Islanders' Cruises, Miami, FL
 Aug. 27—BONAIRE—8 days, Happy Wanderer Travel, Scarsdale, NY
 Aug. 27—BIMINI—7 days, Capt. LaChance, Adventure Cruises, Ft. Lauderdale, FL
 Aug. 28—CAYMAN ISLANDS—8 days, See & Sea Travel, San Francisco, CA
 Aug. 28—BRITISH HONDURAS—7 days, Berry Distributors, Inc., Alsip, IL
 Aug. 29—BELIZE—7 days, Go Diving, Inc., Minneapolis, MN
 Sept. 1, 15, 29—MAJURO—9 days, Micronesian Expeditions, Salt Lake City, UT
 Sept. 2—TAHITI—15 days, Explorer Division, BSA, Los Angeles, CA
 Sept. 3—CAYMAN BRAC—3 days, World Wide Divers Inc., New York, NY
 Sept. 3—BONAIRE—8 days, World Wide Divers Inc., New York, NY
 Sept. 3—BAHAMAS—7 days, Tropic Diving Cruises Inc., Ft. Lauderdale, FL
 Sept. 3, 10, 17, 24—BONAIRE—8 days, Lisind Int'l, New York, NY
 Sept. 3, 10—HAITI—5 or 8 days, Oceaneers Dive Tours Inc., Hollywood, FL
 Sept. 4—LONG ISLAND, BAHAMAS—8 days, Ski & Dive Shop, Washington, DC
 Sept. 4—BRITISH VIRGIN ISLANDS—12 days, Trimaran Misty Law, St. Thomas, VI
 Sept. 4—COZUMEL—8 days, See & Sea Travel, San Francisco, CA
 Sept. 4—SEA OF CORTEZ—9 days, Sunland Int'l Tours, Beverly Hills, CA
 Sept. 4—COZUMEL—8 days, Oceaneers Dive Tours, Inc., Hollywood, FL
 Sept. 4—FLORIDA KEYS—7 days, Berry Distributors, Inc., Alsip, IL
 Sept. 5—SAN ANDRES—8 days, Go Diving, Inc., Minneapolis, MN
 Sept. 10—SAN SALVADOR—8 days, Horizons Int'l, Seattle, WA
 Sept. 11, 17, 23—BIMINI—5 days, Capt. Tom Guarino, Dive Boat Annie-Up, Key Largo, FL
 Sept. 11—ROATAN—8 days, Go Diving, Inc., Minneapolis, MN



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- Sept. 11, 20 — BIMINI — 7 days, Capt. LaChance, Adventure Cruises, Ft. Lauderdale, FL
- Sept. 16 — KONA, HAWAII — 5 days, Horizons Int'l, Seattle, WA
- Sept. 17 — BONAIRE — 8 days, Happy Wanderer Travel, Scarsdale, NY
- Sept. 18 — CARTAGENA, COLOMBIA — 8 days, World Wide Divers Inc., New York, NY
- Sept. 18 — MIAMI — 10 days, Capt. Ed Deckard, Islanders' Cruises, Miami, FL
- Sept. 18 — COZUMEL — 8 days, Go Diving, Inc., Minneapolis, MN
- Sept. 18 — AKUMAL — 8 days, Lisind Int'l, New York, NY
- Sept. 18 — BONAIRE — 8 days, See & Sea Travel, San Francisco, CA
- Sept. 18 — BRITISH VIRGIN ISLANDS — 12 days, Trimaran Misty Law, St. Thomas, VI
- Sept. 19 — CARTAGENA, COLOMBIA — 8 days, Sunland Int'l Tours, Beverly Hills, CA
- Sept. 25 — FREEPORT — 8 days, Go Diving, Inc., Minneapolis, MN
- Sept. 30 — HERON ISLAND — 14 days, Bay Travel, Corona del Mar, CA
- Oct. 1, 8, 15, 22, 29 — BONAIRE — 8 days, Lisind Int'l, New York, NY
- Oct. 1, 8, 15, 22, 29 — HAITI — 5 or 8 days, Oceaneers Dive Tours Inc., Hollywood, FL
- Oct. 1 — COZUMEL — 8 days, Sunland Int'l Tours, Beverly Hills, CA
- Oct. 2, 10 — BIMINI — 7 days, Capt. Tom Guarino, Dive Boat Annie-Up, Key Largo, FL
- Oct. 3 — BELIZE — 7 days, Go Diving, Inc., Minneapolis, MN
- Oct. 3 — BAHAMAS — 7 days, Berry Distributors, Inc., Alsip, IL
- Oct. 5 — BIMINI — 7 days, Capt. Ed Deckard, Islanders' Cruises, Miami, FL
- Oct. 8 — BONAIRE — 8 days, Happy Wanderer Travel, Scarsdale, NY
- Oct. 9 — BRITISH VIRGIN ISLANDS — 12 days, Trimaran Misty Law, Hollywood, FL
- Oct. 9 — AQABA, JORDAN — 17 days, Rich Bergero, See & Sea Travel, San Francisco, CA
- Oct. 10 — SAN SALVADOR ISLAND, BAHAMAS — World Wide Divers Inc., New York, NY
- Oct. 10 — SAN ANDRES — 8 days, Go Diving, Inc., Minneapolis, MN
- Oct. 12-28 — AUSTRALIA/CORAL SEA — 17 days, Ron Merker, See & Sea, San Francisco, CA
- Oct. 15 — BIMINI — 7 days, Capt. Ed Deckard, Islanders' Cruises, Miami, FL
- Oct. 16 — CARTAGENA, COLOMBIA — 8 days, World Wide Divers Inc., New York, NY
- Oct. 16 — GRAND CAYMAN — 8 days, Horizons Int'l, Seattle, WA
- Oct. 16 — CAYMAN ISLANDS — 8 days, See & Sea Travel, San Francisco, CA
- Oct. 16 — ROATAN — 8 days, Go Diving, Inc., Minneapolis, MN
- Oct. 17 — BIMINI — 5 days, Capt. Tom Guarino, Dive Boat Annie-Up, Key Largo, FL
- Oct. 20 — FLORIDA CAVES — 5 days, Berry Distributors, Inc., Alsip, IL
- Oct. 21 — KONA, HAWAII — 5 days, Horizons Int'l, Seattle, WA
- Oct. 23 — COZUMEL — 8 days, Go Diving, Inc., Minneapolis, MN
- Oct. 23 — COZUMEL — 8 days, See & Sea Travel, San Francisco, CA
- Oct. 23 — BONAIRE — 8 days, See & Sea, San Francisco, CA
- Oct. 23 — BRITISH VIRGIN ISLANDS — 12 days, Trimaran Misty Law, St. Thomas, VI
- Oct. 23 — CARTAGENA, COLOMBIA — 8 days, Sunland Int'l Tours, Beverly Hills, CA
- Oct. 25 — BIMINI — 7 days, Capt. Ed Deckard, Islanders' Cruises, Miami, FL
- Oct. 26 — AUSTRALIA/CORAL SEA — 17 days, Carl Roessler, See & Sea Travel, San Francisco, CA
- Oct. 29 — HERON ISLAND — 14 days, Bay Travel, Corona del Mar, CA
- Oct. 30 — FREEPORT — 8 days, Go Diving, Inc., Minneapolis, MN
- Oct. 31 — ARUBA — 8 days, Happy Wanderer Travel, Scarsdale, NY
- Nov. 5, 12, 19, 26 — BONAIRE — 8 days, Lisind Int'l, New York, NY
- Nov. 1, 6 — BIMINI — 5 days, Capt. Tom Guarino, Dive Boat Annie-Up, Key Largo, FL
- Nov. 5, 12, 19, 26 — HAITI — 5 or 8 days, Oceaneers Dive Tours Inc., Hollywood, FL
- Nov. 6 — CAYMAN ISLANDS — 8 days, See & Sea, San Francisco, CA
- Nov. 6 — FLORIDA KEYS — 7 days, Berry Distributors, Inc., Alsip, IL
- Nov. 7 — SAN SALVADOR ISLAND, BAHAMAS — World Wide Divers Inc., New York, NY
- Nov. 7 — BELIZE — 7 days, Go Diving, Inc., Minneapolis, MN
- Nov. 12 — BELIZE — 7 days, NASDS store/school, Denver, CO
- Nov. 12, 19, 26 — BONAIRE — 8 days, Lisind Int'l, New York, NY
- Nov. 12 — BONAIRE — 8 days, Happy Wanderer, Bronxville, NY
- Nov. 12 — COZUMEL — 8 days, Sunland Int'l Tours, Beverly Hills, CA
- Nov. 14 — SAN ANDRES — 8 days, Go Diving, Inc., Minneapolis, MN
- Nov. 18 — KONA, HAWAII — 5 days, Horizons Int'l, Seattle, WA
- Nov. 19 — BELIZE — 7 days, NASDS store/school, Phoenix, AZ
- Nov. 20 — ROATAN — 8 days, Go Diving, Inc., Minneapolis, MN
- Nov. 20 — COZUMEL — 8 days, See & Sea Travel, San Francisco, CA



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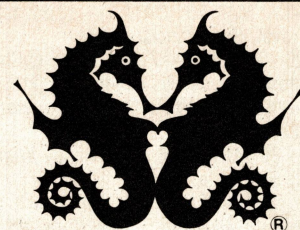


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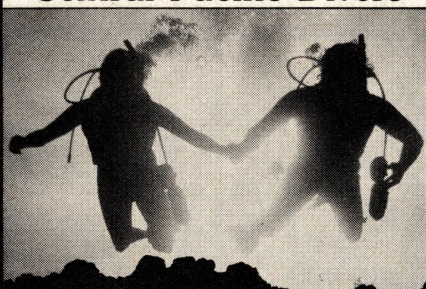
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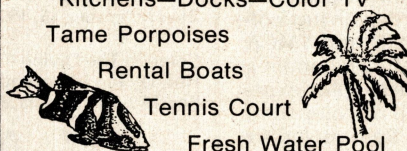
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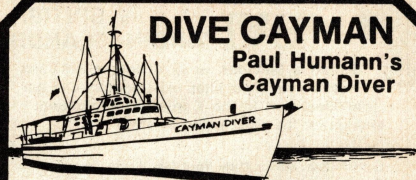
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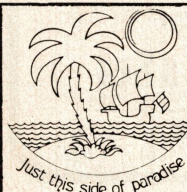
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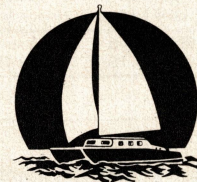
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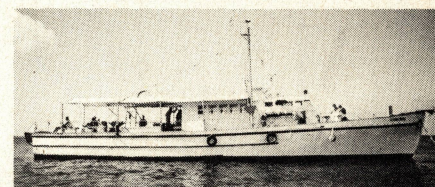
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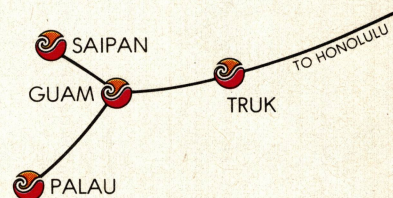
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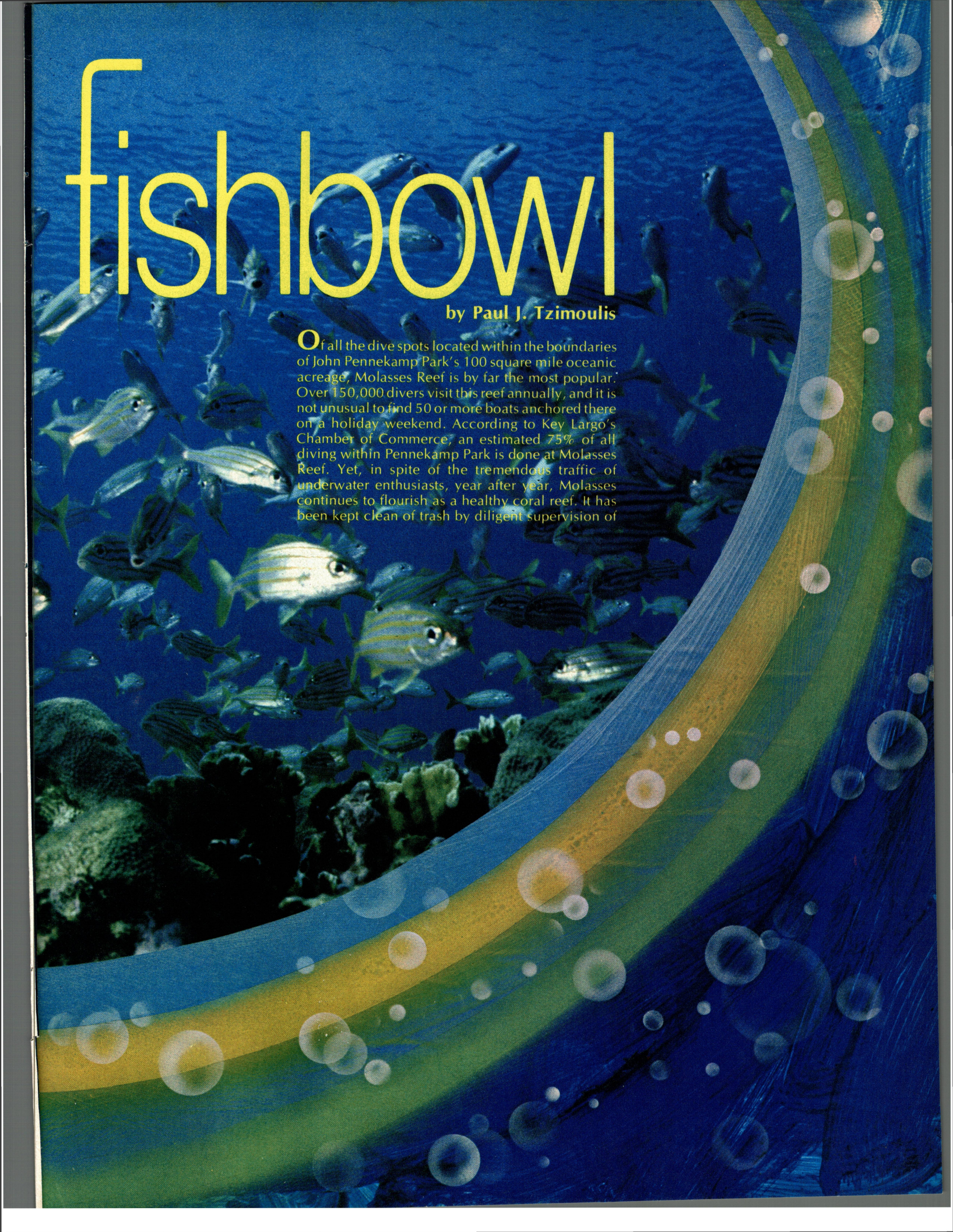


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An underwater scene featuring a large school of silver fish with yellow stripes swimming in clear blue water. A vibrant rainbow wave curves across the left side of the frame. Numerous white bubbles of various sizes are scattered throughout the water. In the bottom right corner, a portion of a green, textured rock formation is visible.

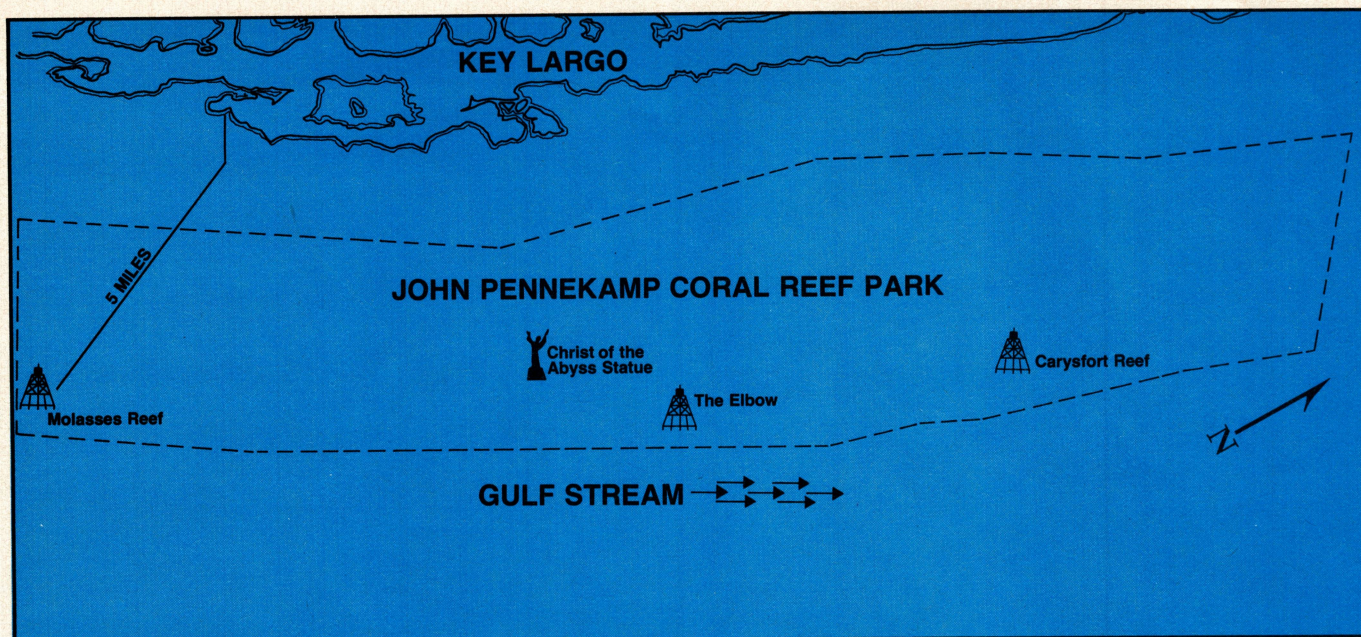
Pennekamp Park's fabulous

A vibrant underwater photograph of a coral reef teeming with numerous small, striped fish. The scene is set against a deep blue background. In the lower right, a large, curved, multi-colored graphic element resembling a rainbow or a stylized wave sweeps across the frame, transitioning from blue to yellow to green. Numerous white, translucent bubbles of various sizes are scattered throughout the water, particularly concentrated along the curved graphic and in the lower right corner.

fishbowl

by Paul J. Tzimoulis

Of all the dive spots located within the boundaries of John Pennekamp Park's 100 square mile oceanic acreage, Molasses Reef is by far the most popular. Over 150,000 divers visit this reef annually, and it is not unusual to find 50 or more boats anchored there on a holiday weekend. According to Key Largo's Chamber of Commerce, an estimated 75% of all diving within Pennekamp Park is done at Molasses Reef. Yet, in spite of the tremendous traffic of underwater enthusiasts, year after year, Molasses continues to flourish as a healthy coral reef. It has been kept clean of trash by diligent supervision of



Molasses Reef is located in the Southeast portion of John Pennkamp Coral Reef Park just five miles from the park headquarters.

the dive guides, and it is protected from spearfishermen and coral collectors by constant patrols of conservation officers.

Why is Molasses so popular? First of all, it is one of the prettiest reefs within the entire park, and the underwater visibility is consistently better than many other areas closer to shore. Molasses is also an easy reef to locate because of a 75 foot high steel tower which pinpoints its position. The reef is visited by diving charter boats from Key Largo, rental boats from Pennkamp State Park, private craft and dive boats from Islamorada. More importantly, Molasses is world renowned for its tremendous congregation of marine life. It is a veritable fish bowl, packed with schooling grunt, large groupers, squadrons of barracuda, and a congregation of no less than a hundred species of reef fish. Few places in the Caribbean could match Molasses for the abundance and variety of fish life. Much of the credit for this undersea phenomenon is due to park regulations prohibiting spearfishing, as well as daily hand feeding conducted by the professional underwater guides who work in this area.

Molasses Reef is located at the southeast corner of Pennkamp Park, in an area which is closest to the crystalline waters of the Gulf Stream. It is approximately five miles from the end of the boat channel which winds its way through Pennkamp's mangrove gardens. The boat ride averages 35 to 40 minutes for most dive boats operating from Key Largo.

The reef itself is approximately 1¼ miles long and averages a half mile in width. It is a broad, sprawling formation of shallow reef corals separated by pockets and gulleys of fine white silica sand. Depths on this reef are no deeper than 30 feet in the sand areas, and usually 10 to 20 feet to the top of the coral formations. The corals here are massive structures of magnificent shapes and proportions. You'll find brain corals measuring six to eight feet in diameter, and mountainous ridges of star and button coral. There are also great stands of elkhorn and beds of delicate staghorn. From the air, the reef appears to be a mouse maze of winding coral canyons, coral formations and sand patches. It would take a diver weeks to explore and understand this intricate system of formations.

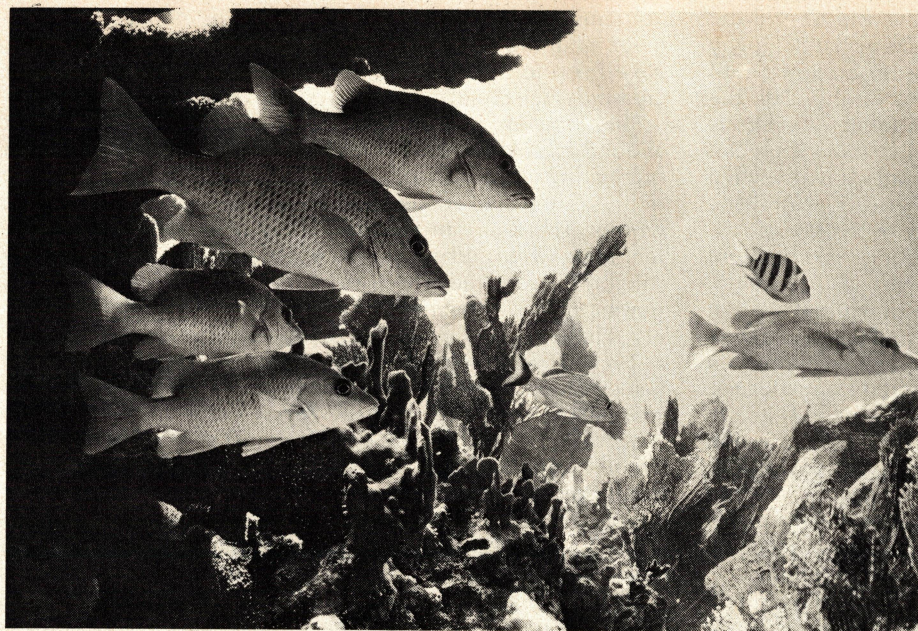
In an attempt to map this unusually complicated reef, I recently spent a week diving on Molasses under the capable guidance of Bill Crawford, one of Key Largo's most affable

dive guides. Although each guide generally has his own name for favorite spots, the general description of each location makes it easy to identify. Regardless of the name, there are certain unusual reef formations and other distinctive landmarks which make specific locations readily identifiable. The following is a list of seven spots on Molasses which are located in just one small section of the reef. It provides merely a sample of the marvelous beauty and undersea attractions which await Pennkamp Park visitors.

HOLE-IN-THE-WALL — One of the most distinctive formations to be found anywhere on Molasses Reef is a coral archway which penetrates a narrow portion of a fairly long coral ridge. Located at a depth of approximately 25 feet, the diameter of this hole is roughly four feet. The hole is irregular in shape, but more square than round. There are always a few grunt and snapper which seem to hang around this spot, and they provide excellent subjects for some interesting photographic angles. There is a small black and white spotted moray which lives in the lower corner of this archway and also several large banded coral shrimp which occupy a small crevice close to the sea floor. The archway is large enough for a diver to swim through and it has become a very popular spot among both scuba and snorkel divers.

THE WINCH — Just a few feet down the ravine from Hole-In-The-Wall, one will find a large sand patch strewn with the wreckage of an old-time sailing ship. The most prominent item is a large mechanical winch or windlass, probably used for hauling up the anchor chain. The winch is lying in an open area, is well lit by natural sunlight and encrusted with coral. Because it is sitting in only 25 feet of water, this magnificent artifact of old sailing days provides a nostalgic background for underwater photography. Close by are other heavy pieces of metal rigging, including a mast ring. There is a big green moray eel which lives in the coral head next to the winch. He is approximately 4½ feet long and makes an ideal subject for close-up pictures.

'CUDA CITY — Adjacent to the Winch is a large sand patch area with a carpeting of fine white sand. It is a favorite gathering place for small and medium size barracuda. There are usually 20 to 30 of these fish hanging almost motionless two to five feet off the bottom. Most of the cuda measure 12 to 28



photography by Author

Molasses Reef is one of the fishiest dive spots in the Florida Keys. The fish are extremely friendly as they have been hand fed by visiting scuba divers for many years. Right, fish lazily cruise through one of the most distinctive coral archways, Hole-in-the-Wall.

inches in length, and could hardly be considered adult specimens. Because the fish are young and quite curious, it is fairly easy to approach these barracuda at close range and obtain close-up pictures. By lying flat on the sand bottom and remaining motionless, you can often coax the 'cudas to within two feet of your camera lens. Should these fish act shy or disinterested, the flashing of your shiny knife blade will usually provoke immediate attention and a closer approach.

EAGLE RAY RAVINE — There are at least four sand canyons which lead off from the sand patch surrounding the Winch. One of the larger ones which eventually opens into another sandy area, is known as Eagle Ray Ravine. The depth here is 30 feet and the bottom is a mixture of sand and coral gravel. This ravine was so named for the eagle rays which often swim the length of this sandy gulley. It seems to be a natural trail or pathway for many of the pelagic fish species who frequently visit Molasses. In addition to the eagle rays, there are a number of turtles, sting rays, and even one hammerhead shark which is seen cruising down this ravine on a fairly regular basis.

CRAWFORD'S RIDGE — One side of Eagle Ray Ravine is bordered by a lovely coral ridge approximately 125 feet in length and 50 feet wide. This coral formation rises up from the sandy bottom some 8 to 12 feet and is adorned by a lovely array of coral. There are several exquisite formations of elk-horn and two giant brain corals measuring some six feet in diameter. It is considered one of the prettiest spots on all Molasses Reef and a special favorite with professional underwater photographers who work in this area. Schools of small blue striped grunt, yellow grunt and porkfish are almost always gathered around this reef. You can always find a resident gray angelfish, French angelfish, ocean triggerfish, and several species of colorful butterflyfish in this area. Most of these creatures have been hand fed by divers for many years and are as friendly as house pets. Crawford's Ridge was named by Bill Crawford, who claims it is the finest coral reef in the entire Florida Keys. He says that he has spent more than 3000 hours bottom time on this reef alone and still hasn't tired of it.

SUICIDE CLIFF — Directly across Eagle Ray Ravine from Crawford's Ridge is a very large pinnacle of star coral. It is approximately 22 feet high and cone shaped much like a Christmas tree. The formation is decorated with many small

purple sea fans, buff colored fire coral, and dozens of brightly colored tube worms. It is one of the most prominent coral formations on the entire reef because of its unusual height. It is an excellent location for both close-up and macro photography, and if you're lucky, you may get a picture of the little golden moray which lives at the base of this formation.

GROUPE HOLE — Approximately 75 yards from Crawford's Ridge in the opposite direction is a large, solitary coral head sitting in the middle of a sand patch. Depth to the sand is approximately 35 feet, and this spot is slightly seaward of the main reef. The coral head is virtually hollow and there are several small entrances leading to a large cave inside the head. The cave entrances are much too small to permit the entry of a diver, but if you look inside, you will be astonished to find the cave filled with fish. There are at least five large grouper which live in the cave, weighing between 30 and 60 lbs. each. Keeping company with the grouper are a number of good sized lobsters tucked into the crevices of the cave. But most exciting of all is the presence of a large jewfish which has been estimated at weighing 130 lbs. On rare occasions, this jewfish has been seen cruising the reef out in the open. However, he is generally shy when divers are present and often retreats to the deeper recesses of his cave. With a fair amount of patience and cunning, you can almost get at least one photo of the grouper.

There are at least a dozen or more additional locations on Molasses Reef which are equally as fascinating and worthy of exploration. Each guide has his own special spot and quite often a unique special attraction or animal which never fails to fascinate and delight visitors.

In addition to the normal varieties of reef fish, Molasses Reef has several very unusual residents. If you know where to look, you may be lucky enough to spot one or two during your exploration.

First of all, there is George — a large gray angelfish with a dimple or dent in the fleshy part of his back. Three years ago George had the misfortune of being illegally speared by a novice diver who blundered onto the reef in a private boat. Bill Crawford happened to be in the area and witnessed the sad event. After taking the gun away from the spearfisherman and radioing the Park Patrol, Bill removed the wounded angelfish

from the spear. During the next six months, Bill nursed the injured fish back to health with daily feedings by hand. Slowly the flesh wound began to heal and the hole closed down until it was finally covered over with new skin. To this day, the angelfish has remained his favorite pet. Although George is friendly to most every scuba diver, he demonstrates a special affection for Bill by swimming around his head excitedly when Bill first enters the water. George can usually be found cruising around Crawford's Ridge or in the vicinity of the Winch.

Another unique resident of Crawford's Ridge is a medium sized queen angelfish that has no tail. Strange as it may sound, this particular fish appears to have been born without a tail. It has lived on this reef for at least two years, and it is fascinating to watch how this fish can swim in a fairly normal pattern even though it is missing one of its most important appendages.

If you happen to be interested in pufferfish, there is a very large one which lives in one of the many caves along a sand ravine just north of the main reef area. He is approximately three feet in length and has a head the size of a basketball. Bill Crawford reports that this unusually large puffer measures at least 12 inches between the eyes. This giant is mostly seen on night dives and usually stays in his cave during the day.

One of the more impressive members of the Molasses Reef community is a giant green moray eel estimated to be seven feet in length. This incredibly large eel lives in a coral cave under the elkhorn coral area of Eagle Ray Ravine. Normally he is quite shy and stays well back in his cave. On rare occasions, he has been sighted out on the reef swimming in full open view. This eel has never been hand fed and Bill cautions divers not to attempt it. The eel is just too big for such games.

The most magnificent sight on Molasses is the occasional appearance of a 12 foot hammerhead shark named Jose. This fish has been visiting Molasses for the past six years and has become well-known to the local dive guides. He makes an appearance about two or three times a week, usually in the late afternoon. He comes up out of the deep blue of the Gulf Stream and makes one pass through the reef. He has a specific route which he follows religiously. He generally comes in over Grouper Hole, circles around the Winch, and swims down through Eagle Ray Ravine, returning to the open ocean. Jose is

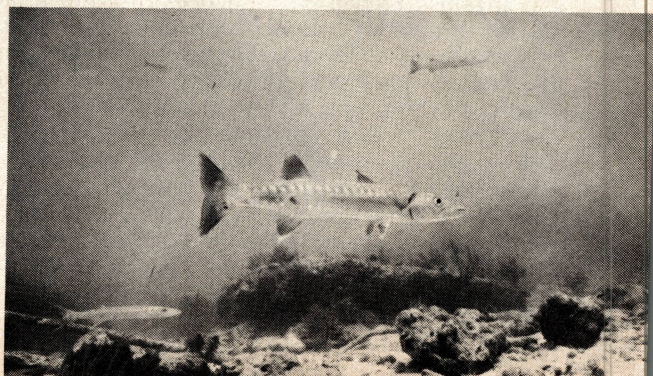
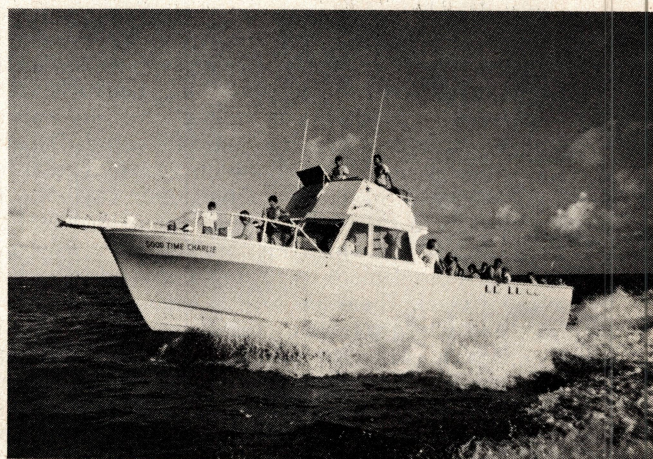
not considered dangerous as he has never menaced a single diver in all the years of scuba diver encounters. A few divers have been fortunate enough to photograph this magnificent creature since his arrival is always a surprise and his visit brief.

Should macro photography be your special love, Molasses abounds with many small creatures and can provide hours of fascinating close-up work. Many of the coral formations are richly adorned with colorful feather dusters and Christmas tree worms. There are an infinite variety of color combinations including white and gold, pink, white and brown, and a lovely salmon shade of red. There are at least two or three species of nudibranch to be found, two of which are the ruffleback variety. There's also a white one with blue spots.

Tucked back into many of the coral crevices are brilliant red flame scallops. This particular bi-valve species has a bright red mantle and pure white feelers. Arrow crabs can be found in great numbers, usually in a crevice adjacent to a long spine sea urchin. Molasses also boasts of some of the largest banded coral shrimp, with specimens measuring four to five inches in length. There are at least three different species of moray eels to be found. The largest are the big green morays, and the black and white spotted morays which generally measure two to three feet in length. The smallest are the golden morays which are only a foot or so long. Molasses Reef is not particularly noted for its sponges, but there are a few species of small finger sponge, cup sponge, and vase sponge. Their colors range from gray to purple to blue.

One of the most controversial topics among traveling divers today is the quality of diving which is available in the Florida Keys. Some divers rave about it, while others consider the Keys to be poor when compared to the Caribbean Islands. Although Molasses Reef does not have the magnificent drop-offs and gigantic sponges of the Caymans or Roatan, it does have fish. In fact, you're likely to see more fish in Pennekamp on a one tank dive than you could see all week during a visit to the islands.

The major source of the controversy lies with the underwater visibility conditions. Water clarity in the Keys is incredibly variable and greatly dependent upon the wind and position of the Gulf Stream. At its best, Molasses Reef can have as much as 120 feet of visibility. This occurs on approximately 10



to 20 days during the entire year, when the Gulf Stream has moved in close to the reef and the surface is absolutely calm. On an average (blue water day) the visibility is approximately 85 feet. This condition occurs approximately 100 days during the year, when surface conditions are calm to moderate, and the Gulf Stream is close to the reef. On the majority of days, visibility ranges from 45 to 55 feet and the water has a slight green tint to it. This condition occurs approximately 200 days per year. Bill Crawford estimates that Molasses gets approximately 30 days of really milky water when visibility drops to a miserable ten feet. Milky water is usually due to storms and heavy surge which tends to churn up the fine sand bottom. Considering the averages, Molasses has a lot more good days than bad. The problem is that wind and water conditions are not predictable on an advanced basis, but the odds are in the diver's favor and the rewards well worth the gamble.

What Pennekamp lacks in visibility, it more than makes up in scuba facilities. Key Largo has more dive shops per mile than any other island in the Caribbean, although Grand Cayman runs a close second. Diving can be purchased on a package deal with room and meals, or it can be bought on an a-la-carte basis. Trips range from a quick half day excursion to a one week cruise on Cay Sal Bank. You can buy just about any type of diving trip imaginable, and the trip rates are the most economical in the country.

Key Largo also has the largest dive boat fleet in tropic waters, anywhere in the world. Over 20 dive boats operate on a daily basis, with some making two trips per day during the busy season. All of the craft are U.S. Coast Guard inspected on a regular basis, and skippered by licensed boat captains. Their hulls are sound and engines in good working order, so the chances of a breakdown are remote. Most of these boats are specially designed for scuba diving and carry dive platforms, ladders, dive flags, static lines, and surface rescue equipment. On the whole, these boats are probably the best equipped and most up-to-date dive boats available.

If you're just getting started in diving, Molasses Reef and the rest of Pennekamp Park would be an ideal introduction to coral reef diving. And if you're a veteran diver who's never tried the Keys, you're missing some really fine diving.

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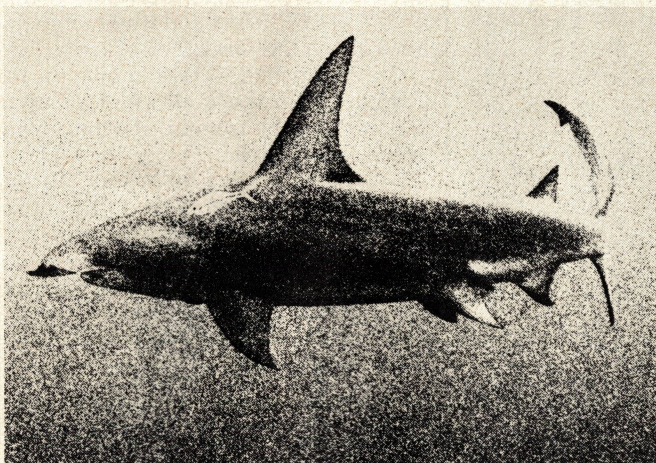
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Far left, barely 10 to 15 feet below the surface lies stately elkhorn corals, sea fans, sea plumes, and other delicate gorgonians. Upper left, the 48 foot dive boat Good Time Charlie is a good example of the fine dive boat facilities available in the Key Largo area. Bottom left, Cuda City is a favorite hangout for a school of friendly barracuda. The cudas are not spooked by the diver's approach, thus offering a good opportunity for underwater photos. Above, a rare photo of Jose, the friendly 12 foot hammerhead shark which visits Molasses Reef twice a week. Right, dive guide and underwater photographer Bill Crawford swims over wreckage of an old sailing ship near an area called The Winch.





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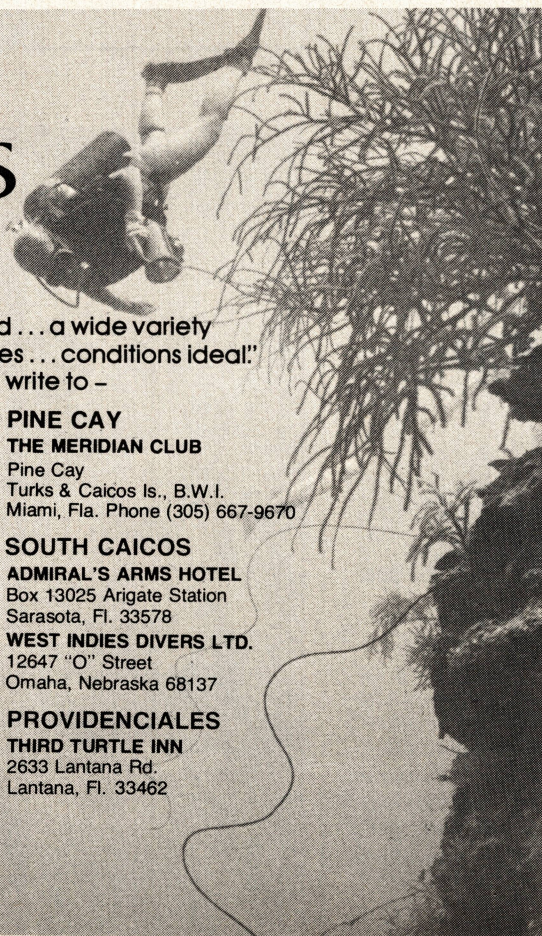
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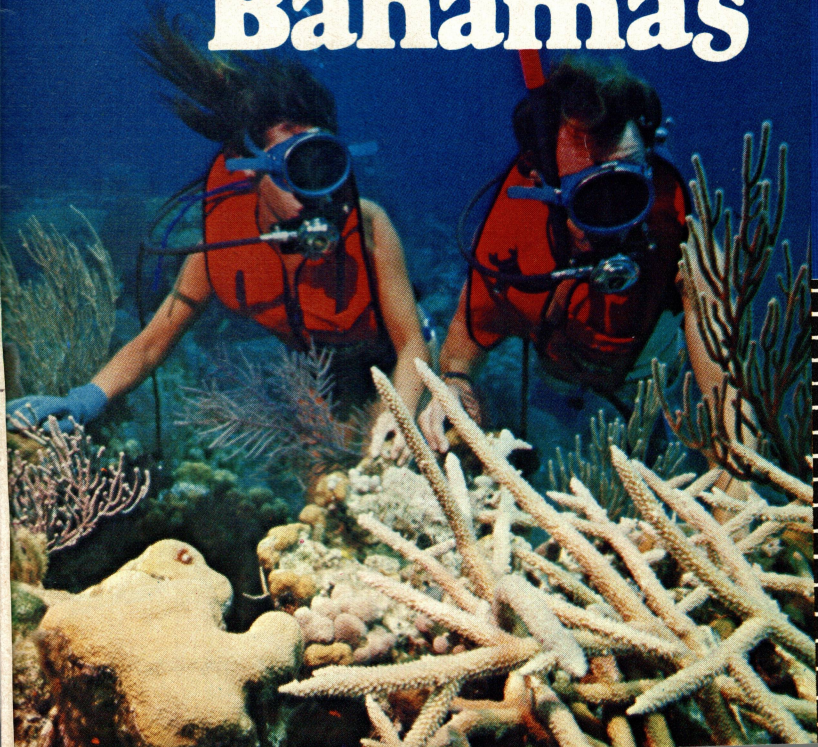
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Medifacts

(Continued from Page 64)

rium, valium, meprobamate; and opiates like heroin, morphine, demerol, percodan, talwin. Heroin deserves special mention. Mainliners and skin poppers (needle users) get blood borne diseases like syphilis and hepatitis. They also get some interesting complications due to impurities in the stuff, since pushers rarely check it out with the F.D.A. And the psychic dependence is incredible. People forcibly deprived for years often resume it at the first opportunity.

Uppers are mostly of the amphetamine group, including speed. They elevate the mood, though it'll be depressed afterwards. Overdone, they cause toxic psychosis with hallucinations, hostility, and weird behavior. Bob Howard, who heads the only commercial diving school behind bars (Chino, Calif.), finds that ex-speed freaks show permanent brain damage with impaired reflexes and mental lapses. They get oxygen seizures more easily than others and tend to come unglued under mild nitrogen narcosis.

Hallucinogens comprise a group of drugs that cuts across other pharmacological classifications, and includes LSD, mescaline, various things that teenyboppers sniff, and the common euphorants amphetamine and marijuana. They distort, or create perceptions which do not reflect objective reality.

Marijuana stimulates the brain's artistic as opposed to intellectual functions, forms, colors, sounds get bigger, better, brighter. You experience things that aren't even there, though you may miss a few that are. This is one thing for a protected party, and quite another for people underwater. You may find the scene more of a turn-on, but you'll be less able to recognize or cope with danger. Divers have been found dead below, with no other clue than marijuana in their boat. While expanding your mind, pot may also expand hang ups, like long suppressed fears, and give you a bad trip. Still other effects include reduced tolerance of hot or cold water, and altered brain wave pattern with impaired recent memory and performance. Heavy use harms the lungs, and some authorities feel it damages sperm cells.

And now a few special warnings. Many tragedies occur because street drugs aren't always what they seem. Two or more drugs taken together may produce unexpected and tragic effects. Finally, high pressure may augment, reverse, or unpredictably alter the effects of a drug. For instance, amphetamine worsens nitrogen narcosis, while certain sedatives improve it. Los Angeles coroner Tom Noguchi reports that of 46 scuba deaths he studied, 20 percent involved drugs, so the problem is real. Our data on this important subject are woefully scanty, and we'd appreciate any input from readers.

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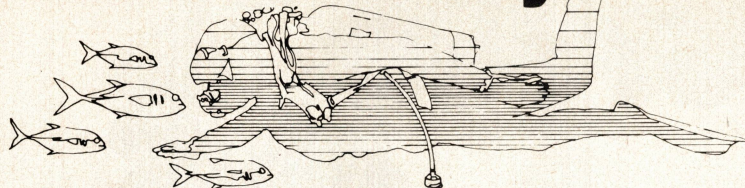
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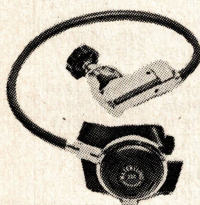
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The festival, organized by Britain's
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which will feature some of the world's
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In addition to the festival prizes there
will be an impressive array of awards for
winners, including 11 silver trophies and
81 gold, silver and bronze medals. There
are 13 main categories involving 18 classes,
plus awards for the best beginner,
best portfolio, creative photography and
the most outstanding entries in various
sections. In brief, the competition
categories are for black and white prints,
color slides, color prints, cine films
(amateur) and cine films (commercial).
Material may be submitted whether or
not it has previously been entered in any
other competition or is intended for such
entry. Closing date Sept. 30, 1976.

Full details of the Fifth International
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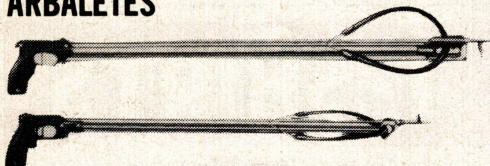
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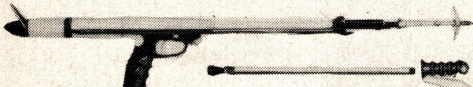


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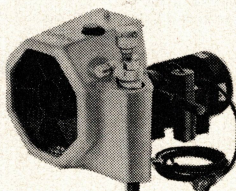
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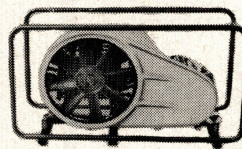
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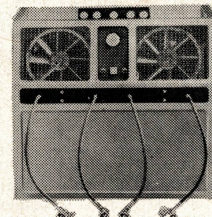
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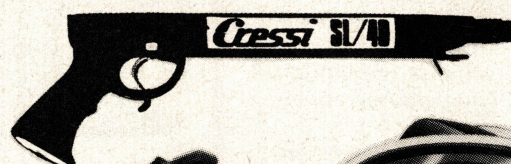
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